THE

AMERICAN REVIEW OF TUBERCULOSIS ABSTRACTS

VOLUME LVI SEPTEMBER, 1947 ABST. NO. 3

Bronchiectasis.—The literature on the pathogenesis of bronchiectasis is critically surveyed; the author concludes that the earlier assumed causes are "inconstant or controversial or unsatisfactory." Several reasons are enumerated against the assumption that elastic tension following atelectasis along with infection of the bronchial wall is the cause; but even if these forces are present their efficacy is doubtful because (*1*) dilatation may precede the destruction of the bronchial wall, (*2*) increased elastic tension is not selective for the atelectatic section of the lung, and infection is neither constant nor selective; bronchiectases are selective only as far as the atelectatic section is concerned, (*3*) lobectomy is followed by an increase of the elastic tension in the remaining lobes, but in spite of this, bronchiectasis does not develop in those lobes, (*4*) the bronchial dilation beyond an obstruction may fail to appear or may be slight in part of the collapsed section. The author assumes that there is only one cause for bronchiectasis which then must be common to the genesis of all cases. The metapneumonic atelectatic and "idiopathic" bronchiectases, (the author assumes that the origin of the latter may be also metapneumonic or atelectatic) have initially one important factor in common: the bronchi are imbedded in non-aerated tissues. The inspiratory movements of the chest wall and diaphragm tend to dilate bronchi, particularly if the latter are surrounded by atelectatic lung tissue. Clinical observations are supposed to confirm that this mechanism is the main or only genesis of bronchiectasis. Since early bronchial dilatation is reversible, early diagnosis is important and bronchography is advised in every suspected case. Early treatment must aim at elimination of dilating forces, including pneumothorax if necessary.—*Genesis of Bronchiectasis, An Unappreciated Broncho-dilating Force, B. Gladnikoff, Acta med. Scandinav., 1946, 126: 411.—(O. Pinner)*

Bronchogenic Carcinoma.—The operability of pulmonary carcinoma at the time of diagnosis remains disappointingly low. The author surveyed 343 cases observed at the University of Michigan Hospital from January, 1938 to January, 1944. This study is based on 231 patients in this group in whom diagnosis was verified histologically. Over 80 per cent of the cases were males. Age varied from 18 to 77, the majority occurring between 40 and 60 years of age. The majority of the lesions were close to the hilum; the remainder were of the peripheral type. The regional lymph nodes were the most frequent sites of metastasis. Next in order of frequency were the following: one or both lungs, pleura and liver, brain and one or more bones. The most frequent types of spread denoting inoperability were pleural involvement, supraclavicular nodes, recurrent laryngeal nerve paralysis, lesions at or adjacent to the carina, cerebral or bone metastasis, phrenic nerve paralysis and direct extension to the chest wall. Squamous cell tumors were found most frequently and offered the best prognosis. Prognosis was poorest in the undifferentiated cell-type. Adenocarcinoma was found most frequently in women. This latter prepon-

derance suggests a possible relationship between adenocarcinoma of the lung and bronchial adenoma which also occurs more frequently in females and has many histological similarities to adenocarcinoma. In over half the cases, the correct diagnosis was not made until nine or more months after onset of symptoms. The most frequent initial symptoms were cough, pneumonia, "flu", cold, chest pain, hemoptysis, dyspnea and ease of fatigue. Weight loss is usually a late manifestation. Early diagnosis depends on careful investigation of any prolonged respiratory complaints, particularly in males past 40 years of age. Bronchoscopy is the most important diagnostic procedure. The percentage of positive bronchoscopic biopsies was 90.1 in the inoperable group and 86.3 in the operable group. Aspiration biopsy is potentially dangerous and is not recommended. The presence of pleural fluid does not necessarily mean pleural metastasis but the presence of blood fluid generally denotes inoperability. Carcinoma cells were found in the fluid of 7 of the 38 cases with effusion. Tumor cells may sometimes be found in the sputum. If diagnosis cannot be otherwise established, exploratory thoracotomy is justified. Surgical extirpation is the only curative treatment. Pneumonectomy, rather than lobectomy, assures complete removal wherever this is at all possible. Except where employed for palliation in inoperable cases, X-ray therapy is condemned since any improvement in an operable case only postpones surgery. Only 77 cases were considered operable in this group and resection was possible in only 44. Seventeen, or 39.5 per cent, of the resected cases lived from two months to three years postoperatively. Thirteen, or 30 per cent, are alive two to seven years after operation. Empyema accounted for 4 of the 17 deaths following resection; present use of chemotherapy will probably reduce this incidence.—*Bronchiogenic Carcinoma: An Analysis of 343 Cases, R. K. Hollingsworth, Ann. Int. Med., March, 1947, 26: 377.*—(*H. R. Nayer*)

Bronchial Adenoma.—After a review of the literature and presentation of 6 cases of bronchogenic adenoma the following conclusions are drawn: Adenoma of the bronchus represents a relatively simple diagnostic problem. It has been stated that this tumor is potentially malignant and that in most instances it degenerates into a bronchogenic carcinoma. By some continental observers it has been defined as carcinoid and by others as basal cell carcinoma. It also has been stated that, while clinically it is benign, pathologically it is malignant. The view that the adenoma is a benign tumor, by nearly all criteria, is gaining ground. Metastases have been observed in extremely few instances. They were few and minute and were discovered accidentally at postmortem examination. No recurrences were observed following removal of the tumor which *per se* caused no deaths. Not even locally is the adenoma malignant. In its growth it may form a bulge but hardly ever a break through. The assertion that bronchogenic adenoma often degenerates into bronchogenic carcinoma has not been confirmed. The adenoma is expansive but not invasive. It is the commonest benign bronchial tumor, comprising from 6 to 12 per cent of all bronchial neoplasms. It is prevalent in patients in the third and fourth decades and occurs oftener in women and more frequently on the right side. It occurs in bronchi accessible to inspection with the bronchoscope and presumably easily diagnosed. Therapy applied in the early stages eradicates the disease, while dilatoriness is fraught with dangerous complications, such as putrid abscess and bronchiectasis, pneumonitis and empyema.—*Bronchiogenic Adenoma: Benign Tumor of the Bronchus, B. M. Fried, Arch. Int. Med., March, 1947, 79: 291.*—(*G. C. Leiner*)

Mediastinal Tumors.—Operations for mediastinal tumors have been done on 109 patients in the Army Thoracic Surgery Centers in the U. S. during the past three years. The number is relatively small because of the routine chest X-rays before acceptance for military service. The cases in this series were

found when symptoms developed (15 cases) or by routine X-ray examinations of personnel on active duty (94 cases). There were 94 benign tumors submitted to exploration; 89 were successfully removed and 5 'tumors' proved to be aneurysms. Fifteen tumors were malignant, of which only 3 could be removed. There was no mortality from the explorations. Lymphogranulomata have not been included except when erroneous diagnosis resulted in exploration. The most common benign tumors were bronchogenic cysts (23), dermoids and teratomata (14), primary nerve tumors (29) and pericardial cysts (10). The most common malignant neoplasms were teratomata (6), with Hodgkin's disease being found four times. The usual location of each type of tumor is described. The relative safety of exploratory thoracotomy recommends it for treatment, as well as for diagnosis.—*Mediastinal Tumors: Report of Cases Treated at Army Thoracic Surgery Centers in the United States, B. Blades, Ann. Surg., May, 1946, 123: 749.*—(*W. H. Oatway, Jr.*)

Eosinophilic Granuloma.—A 31-year-old man was seen who complained of headache in the left occipital region and of backache. Roentgenograms revealed bony defects in the left parietal bone and in the occipital bone, and areas of destruction in the left iliac and the pubic bones and in the body of the third lumbar vertebra; fine nodular infiltrations were seen in the upper halves of both lungs. The blood count showed eosinophilia. A diagnosis of eosinophilic granuloma of bone was made. A biopsy from the lesion in the left parietal bone revealed histiocytes, focal accumulation of eosinophils, lymphocytes, plasma cells, increase in connective tissue and proliferation of the endothelium. Following roentgen ray therapy there was evidence of healing of the bone and lung lesions. The pulmonary lesion is believed to be a visceral involvement as a part of the general picture of eosinophilic granuloma of bone. "If this is true, this is the first such case reported."—*Eosinophilic Granuloma of Bone: Report of a Case with Multiple Lesions of Bone and Pulmonary Infiltration, A. Weinstein, H. C. Francis & B. F. Sprofkin, Arch. Int. Med., February, 1947, 79: 176.*—(*G. C. Leiner*)

Air Embolism.—In pulmonary (venous) air embolism, air enters one of the systemic veins, is carried to the right heart and obstructs the outflow tract of the right ventricle. In arterial embolism, air enters the pulmonary veins and is carried to the left heart and into the systemic arteries. The symptoms and signs of pulmonary air embolism are a loud, churning sound over the heart, rise of venous pressure, cyanosis, falling blood pressure, rapid pulse and syncope due to cerebral ischemia. In arterial embolism various neurological manifestations and symptoms and signs of myocardial infarction occur. Ten dogs received air injections into the femoral vein with the thorax intact. In 10 dogs the thorax was opened by a sternum-splitting incision before air was injected into the femoral vein. The following factors were found to be related to mortality: (*1*) Amount of air injected. (*2*) Speed of injection. (*3*) Position of animal: The animal can tolerate more air when lying on his left side than in any other position. (*4*) Effectiveness of the pulmonary excretory mechanism: Tachypnea tends to prevent death. Death was found to be caused by circulatory obstruction resulting from an air trap in the right ventricular outflow tract. Displacement of the air trap by turning the body in to the left lateral position may be life saving, even after the right ventricular contractions have become feeble. The electrocardiographic changes seen in air embolism are discussed.—*Pulmonary (Venous) Air Embolism, T. M. Durant, Joan Long & M. J. Oppenheimer, Am. Heart J., March, 1947, 33: 269.*—(*G. C. Leiner*)

Bronchial Obstruction and Emphysema.—When a bronchus is completely obstructed atelectasis results. If the obstruction is not complete, alveolar emphysema of the area ventilated through that bronchus follows. The authors have studied the mechanism of

its production, since they were not satisfied with the usual explanations of its occurrence. The generally accepted theory has been that the intensity of the inspiratory pressure is more than that of expiration, and that, because expiration is weaker than inspiration, it becomes prolonged and more difficult, especially when there is any obstruction in the bronchus. As a result, the residual air increases and the alveoli become overdistended. Temporary narrowing of the bronchi was produced by inhalation of a broncho-constricting aerosol containing acetyl-choline. This reduced the caliber of the tubes and resulted in dilatation of the alveoli and emphysema with increase of lung volume. By the use of Genaud's pneumograph (P. Genaud. Protection contre les gaz de combat, 1 vol., Vigot, ed., Paris. Article "Physiologie du masque.") variations in pulmonary volume were recorded. Inspiratory and expiratory pressures were determined by having the subject make forced inspirations and forced expirations through a tube connected with a mercurial manometer. The pneumograph apparatus was modified by the addition of a mask with a central opening over which there was a diaphragm so that records could be made separately during inspiration and expiration. Over two hundred persons with either temporary (functional) or permanent (pathological) pulmonary emphysema were studied. It was found that the maximum force of expiration was uniformly greater than the maximum inspiratory pressure. In a number of normal subjects the ratios were as follows, expressed in millimeters of mercury: 25 to 40, 23 to 35, 17 to 26, 16 to 24, etc. During inspiration the inspiratory pressure falls while the bronchial caliber is increasing, and the phenomena counteract each other. On the other hand during expiration, the bronchial pressure steadily diminishes while the caliber of the bronchial tubes becomes less and less, making expiration more difficult and less effective than inspiration. In normal breathing no harm is done, but when the bronchus is obstructed either temporarily or permanently, dilatation of the alveoli and emphysema result. Therapeutic inferences made were that the inhalation of a broncho-dilating aerosol (containing adrenalin) could open the air passages, and breathing exercises could help to develop the expiratory pressure or force, especially in patients with functional or temporary emphysema.—*Emphysème pulmonaire d'origine bronchique, R. Tifferneau & J. Z. Schreiner, Poumon, November–December, 1946, 2: 375.*—(*A. T. Laird*)

Occlusion of Bronchus.—Foreign bodies of vegetable origin located in the bronchus cause a guarded prognosis. The sooner the removal is done, the better is the prognosis. These foreign bodies absorb fluid and eventually convert a partial obstruction of valvular type into a total obstruction. The longer endobronchial removal is delayed, the greater the danger that the foregin body breaks and that fragments of it are disseminated into bronchioli. A boy who had aspirated a bean, which broke during the extraction, is reported. In this case, complete obstruction at the bifurcation resulted from the attempt of extracting the bean and tracheotomy was life-saving.—*Oclusion de bronquio por poroto: Complicaciones en su extraccion, R. Segre, Prensa méd. argent., November 15, 1946, 33: 2313.*—(*W. Swienty*)

Asthma and Heart in Children.—Seventeen children with asthma of an average duration of 4.7 years were examined by various routine and special methods to determine heart size and function. It is concluded that uncomplicated bronchial asthma is not a factor in the production of heart disease.—*The Influence of Bronchial Asthma on the Heart in Childhood, V. J. Derbes & T. Engelhardt, Arch. Pediat., April, 1946, 63: 166.*—(*W. H. Oatway, Jr.*)

Staphylococcal Empyema in Infants.—Forty-two cases of staphylococcal empyema were seen at the St. Louis Children's Hospital in the ten years before penicillin became available. The series comprised 22 per cent of the empyemata from all causes. Staphylo-

coccus infection tended to occur more often in infants than in young children, and was by far the most common type in those under six months of age. In 40.5 per cent it became a pyopneumothorax. The fatality was 26.2 per cent. General supportive measures and adequate surgical drainage are the best therapy. The sulfonamide drugs and specific antiserum were of limited value.—*Diagnosis and Management of Severe Infections in Infants and Children: A Review of Experiences since the Introduction of Sulfonamide Therapy. V. Staphylococcal Empyema: The Importance of Pyopneumothorax as a Complication, G. B. Forbes, J. Pediat., July, 1946,* ***29:*** *45.—(W. H. Oatway, Jr.)*

Penicillin for Staphylococcus Empyema.—Prior to the use of penicillin, fatality from staphylococcal infection of the pleural space was reported to be between 22 and 100 per cent. Sulfonamides and surgery were the most effective methods in such series. Eight cases were treated in Strong Memorial Hospital before penicillin; the mortality was 25 per cent. Seven cases were treated since penicillin became available; one patient died on the second day of treatment (14 per cent). Penicillin was used intrapleurally and intramuscularly, combined with sulfonamides by mouth, aspirations and trocar drainage.—*Penicillin as an Aid in the Treatment of Primary Staphylococcus Pneumonia with Empyema, W. S. Davis, Mary E. Hyman & F. D. Ruhstaller, J. Pediat., January, 1947,* ***30:*** *55.— (W. H. Oatway, Jr.)*

Horizontal Fissure.—Adhesive pleuritis produces shrinkage of the upper lobe in its central free portion. This results in retraction of the horizontal fissure so that the fissure describes a convex curved line on the roentgenogram. This finding has prognostic significance in regard to the possibility of an adequate pneumothorax.—*The Significance of the Retracted and Curved Horizontal Fissure of the Lungs, R. E. Dwork, Am. J. Roentgenol., March, 1947,* ***57:*** *344.—(J. E. Farber)*

Silicotic Vascular Disease.—The perivascular deposit of quartz in the early stages of silicosis produces a stenosing endangitis, perivascular fibrosis and partial destruction of the elastic lamina of the vascular wall. The latter changes, in cases of coincident tuberculosis, facilitate passage of bacilli into the circulation and their dissemination by the blood-stream. *Endangitis obliterans,* by reducing pulmonary circulation, diminishes the working capacity of the patient at a time when pulmonary fibrosis, as seen radiologically, is still in an initial stage. This explains the absence of correlation between extent of fibrosis as seen on the X-ray film and vital capacity and working capacity. Extent and intensity of vascular silicosis are more evident after inhalation of pure quartz.—*Die klinische Bedeutung der silikotischen Gefäss-Schädigung, E. Uehlinger & R. Zollinger, Bull. d. Schweiz. Akad. d. Med. Wissensch., 1946,* ***3:*** *176.—(B. Gerstl)*

Funnel Chest.—Funnel chest, or *pectus excavatum* is not a rare condition. The malformation is almost always a developmental anomaly and may be hereditary. Trauma to the sternum may produce an angulated fracture with resultant funnel chest. The deformity may be of varying degrees, with a depth reaching, at times, up to 7 cm. or more. The heart is usually displaced to the left. This is characteristically shown in the posterior-anterior roentgen view and is readily mistaken for cardiac enlargement. On the lateral view the diagnosis is self-evident as the sternum protrudes backward and is well behind the anterior chest wall. The foregoing is of importance in interpreting miniature chest films where an erroneous interpretation of cardiac disease may be made. In the absence of scoliosis left pleural thickening, left sided atelectasis, right sided pleural effusion, tumors and other known conditions, a presumptive diagnosis of funnel chest can be made when the heart is displaced to the left, with the right cardiac border hidden by the vertebral column, and with an elevated rounded left lower

cardiac border. Electrocardiographic variations in this condition are minor and are probably due to a change in the position of the heart rather than to myocardial disease. Uncomplicated nontraumatic developmental funnel chest does not produce symptoms of a serious nature, probably due to the adequacy of the various compensatory mechanisms. Dyspnea, cough, paroxysms of suffocation, rapid heart action and chest pain have been reported. Most cases of developmental funnel chest need no treatment. Surgical elevation of the sternum may have to be performed in traumatic cases if untoward cardiac manifestations occur. The authors report 9 cases of funnel chest. One of these had bigeminal rhythm due to regularly recurring right ventricular extrasystoles. This was probably due to an irritable focus in the right ventricle resulting from the constant pressure of the deformed sternum in this region.—*The Roentgen and Cardiac Manifestations of Funnel Chest, J. Teplick & E. H. Drake, Am. J. Roentgenol., December, 1946, 56: 721.*—(*J. E. Farber*)

Rib Fractures.—A review of 4,029 cases of chest injuries disclosed 855 cases with single or multiple rib fractures. The one-film two exposure technique is described to facilitate the identification of the fractures. Using this technique, approximately 3 per cent more X-ray films were positive for rib fracture than by the usual technique.—*Fractures of the Ribs, F. Liberson, Am. J. Roentgenol., March, 1947, 57: 349.*—(*J. E. Farber*)

Histoplasmosis in Infant.—Histoplasmosis was demonstrated in a 7-month-old girl with anemia, leukopenia and hepatosplenomegaly, by bone marrow biopsy, histoplasmin skin test and positive cultures from blood, marrow, stool and duodenal contents. Necropsy showed wide-spread dissemination of intracellular yeast forms throughout the body. Culture on 7 per cent horse-blood-agar containing 20 units per cc. each of penicillin and streptomycin at 32° and 38° C. yielded abundant filamentous forms in which characteristic tuberculate chlamydospores developed, from all body tissues and fluids tested except the bile and the cerebrospinal fluid.—*Histoplasmosis in Infancy: The Pathologic Picture as Seen in One Case, L. A. Weed, A. M. Iams & H. M. Keith, Arch. Path., February, 1947, 43: 155.*—(*E. Bogen*)

Double Fungus Infection.—A Negro boy died about three months after the onset of a subacute febrile illness. *Cryptococcus neoformans* (*Torula histolytica*) and *Histoplasma capsulatum* were both grown from the blood and from exudate, and were seen in sections of lesions found at autopsy. Mycological and animal inoculation studies are described.—*Systemic Infection with Cryptococcus neoformans (Torula histolytica) and Histoplasma capsulatum in the Same Patient, G. B. Mider, F. D. Smith & W. E. Bray, Arch. Path., January, 1947, 43: 102.*—(*E. Bogen*)

Surgery for Actinomycosis.—Fifteen per cent of patients with actinomycosis have involvement of the thorax. The infection usually is aspirated to the lungs from the mouth. The pneumonic process suppurates, producing fibrosis, 'burrowing' and sinuses. The intrapulmonary spread is often greater than indicated by X-ray appearances. Only the sulfonamides and penicillin have given encouraging results, and they often require surgical assistance. Two typical cases are reported. Intensive chemotherapy for more than a year had not prevented a steady progress of the lesions. Pneumonectomy was done in each before spread from the lung had occurred. (A lobectomy was insufficient in one case, and the diseased basal lung tissue had to be removed at a second operation.) Four grams of sulfadiazine and 200,000 U. of penicillin were instilled intrapleurally each day for ten to fourteen days after operation. Daily aspirations were necessary for ten days. The recoveries were uneventful; one patient is well at six months, the other at a year following surgery.—*Pulmonary Actinomycosis, E. B. Kay, Ann.*

Surg., September, 1946, 124: 535.—(W. H. Oatway, Jr.)

Pelvic Tumors with Hydrothorax.—A review of the records of the Mayo Clinic disclosed 9 examples of hydrothorax and ascites among 20,000 cases of surgically removed pelvic tumors. The chief complaint was abdominal enlargement and frequently dyspnea. Pain was infrequent. Some patients had an unproductive cough. Physical examinations revealed a pelvic tumor, ascites and hydrothorax. Laboratory data were not significant. The tumors removed consisted of 4 ovarian fibromata, one degenerating uterine fibromyoma, one ovarian fibromyoma, one uterine fibromyoma with pelvic inflammatory disease, one granulosa cell tumor of the ovary and one teratoma of the ovary. The hydrothorax was on the right side in 7 cases, on the left in one and bilateral in one. The fluid in all cases was clear and straw-colored. The fluid showed no evidence of tuberculosis or neoplasm. The end-result in all the cases was good. There were no recurrences of ascites or hydrothorax. The longest period of survival in a case thus far is twenty-seven years.—*Certain Pelvic Tumors Associated with Ascites and Hydrothorax, M. Calmenson, M. B. Dockerty & J. J. Bianco, Surg., Gynec. & Obst., February, 1947, 84: 181.—(A. G. Cohen)*

Gastric Cyst in Thorax.—Only 16 cases of gastric cyst in the mediastinum have been found in the literature. One case is reported in which the cyst communicated with the bronchi of the right lung, producing pneumonitis and hemoptyses. Pneumonectomy was attempted, but the patient expired during the operation. The cyst communicated with a cavity in the postero-medial lung base. It was composed of gastric mucosa, musculature and nerves, and ended 5 cm. below the diaphragm in a blind sac.—*Thoracic Gastric Cyst, A. R. Valle & M. L. White, Jr., Ann. Surg., March, 1946, 123: 377.—(W. H. Oatway, Jr.)*

Phrenic Injury.—Paralysis of the diaphragm due to a birth injury to the phrenic nerve may occur and may produce serious symptoms. The eighth case of that sort to be reported was diagnosed by fluoroscopy on the seventh day of life, after three days of symptoms. Brachial paralysis was not associated. The nerve was 'rested' by placing the infant on the involved side, by continuous use of oxygen, and by gavage feedings. Normal function occurred after six days of treatment.—*Right-Sided Transient Paralysis of the Diaphragm in the Newborn Infant, J. V. Greenebaum & F. G. Harper, J. Pediat., April, 1946, 28: 483.—(W. H. Oatway, Jr.)*

Myasthenia and Thymic Tumor.—In 17 of a series of 100 cases of myasthenia gravis, X-ray examination disclosed a tumor in the anterior mediastinum. Exploratory operation was performed and in all but one case microscopic examination showed a tumor orginating in the thymus gland. Routine fluoroscopy and lateral X-ray films as well as standard films are recommended for all cases of myasthenia gravis for the demonstration of thymic tumors.—*Roentgenologic Findings in Myasthenia Gravis Associated with Thymic Tumor, C. A. Good, Am. J. Roentgenol., March, 1947, 57: 305.—(J. E. Farber)*

Sympathectomy.—This procedure may be subject to the following complications: extrapleural hemothorax, pneumothorax, pleural effusion, atelectasis and mediastinal emphysema. Extrapleural hemothorax is the most serious of these complications. X-ray examination and diagnosis of extrapleural fluid collections is discussed.—*Pulmonary Complications of Dorsal Sympathectomy, R. C. Pendergrass & F. F. Allbritten, Jr., Am. J. Roentgenol., February, 1947, 57: 205.—(J. E. Farber)*

Sarcoidosis.—A study of 42 cases of Boeck's sarcoidosis is presented. The majority of these patients had involvement of the mediastinal and peripheral lymph nodes. A differential diagnosis between sarcoidosis and

lymphomata is presented. Radiation therapy of sarcoidosis is also discussed. The authors believe that radiation therapy is indicated when symptoms are present.—*Boeck's Sarcoid (Sarcoidosis), A. Oppenheim & R. S. Pollack, Am. J. Roentgenol., January, 1947, 57: 28.—(J. E. Farber)*

Tuberculosis in Sugar Plantations.—Examination of school children and pre-school children in the northern rural part of the State of Rio de Janeiro, Brazil, showed tuberculosis disease and tuberculosis infection rates comparable to those in the Federal District of the country and far higher than those in the southern part of the neighboring State of Espírito Santo. Among possible causes are sugar mills with comparatively recent industrialization. Tuberculosis infection rates in a sugar mill district averaged 29.4 per cent in pre-school children, as compared to 37.3 per cent in a single isolated school, 43.8 per cent in a kindergarten and 60.5 per cent in a school group. The infection rate decreased slightly and the disease rate increased with the proximity to rural areas. In a school group less than six miles from an urban centre, skin tests were positive in 80.3 per cent, as compared to 64 per cent in a similar group in the city of Rio. The high tuberculosis rates show the need of BCG vaccination in anergic cases. More than 1,000 children were vaccinated as a result of this study.—*A tuberculose nas usinas de açúcar do Norte Fluminense, M. A. Fleury da Silveira, Clín. tisiol., July-September, 1946, 1: 237.—(A. A. Moll)*

Minimal Tuberculosis.—Fifty-five patients with small unilateral, active, radiologically non-cavitating tuberculous lesions underwent treatment in an institution. Thirty-four patients had bed-rest alone; of these, 17 relapsed, including 2 who relapsed twice. Twenty-nine patients received collapse therapy (8 after relapse in group 1); among these, there were no relapses. The patients who relapsed had been in the institution for the least length of time and had returned to work earlier. One-half of the relapses occurred within the first year after discharge. Most occurred during the years 1943 to 1945 as a result of the exigencies of the war. Relapses in the conservatively treated group took place despite the patients having been away from work for three to eighteen months.—*The Treatment of Minimal Tuberculous Chest Lesions, R. Heller, Tubercle, March, 1947, 28: 49.—(A. G. Cohen)*

Treatment of Noncavernous Tuberculosis.—Tuberculosis literature deals largely with treatment of patients showing cavities in their lungs; scant attention has been paid to that ever-increasing number of early diagnosed non-cavernous group of patients with unilateral or bilateral infiltrations, with or without bacilli in their sputum. Which cases should be treated with pneumothorax among this group without cavities? Reports from the Øresund Hospital in Copenhagen analyzing unilateral cases in which the extension of the lesion was less than one-half of one lung, including cases with small cavities (up to 2 cm. in diameter) revealed that 63 per cent of the pneumothorax treated patients with cavities recovered as against only 26 per cent recovering with conservative treatment. In the non-cavernous cases, the corresponding figures for recovery were 56 and 42 per cent for the two types of therapy. A comparable series is presented in this paper from the Skørping Sanatorium, dealing with 226 patients without cavities and followed for at least five years. Only 36 patients received pneumothorax treatment for widely different types of lesions, making any conclusions impossible as to the efficacy of treatment. Of the 190 patients treated conservatively, results are rather poor regarding recoveries: 40 per cent of unilateral bacillary cases, 34 per cent of bilateral bacillary cases, 59 per cent abacillary unilateral and 50 per cent abacillary bilateral. Even though this series is small and statistically inconclusive, it is published to emphasize the serious prognosis of non-cavernous tuberculosis in every case under conservative treatment—a fact which appears to be insufficiently recognized.—*On the Treatment and*

Prognosis of Pulmonary Tuberculosis without Cavitation, E. Strandgaard, Acta tuberc. Scandinav., 1946, 20: 183.—(P. Q. Edwards)

Tuberculosis and Right Heart Disease.—The electrocardiogram is the only useful means of detecting right heart strain before it becomes manifest clinically as right heart failure. Of the 163 patients with advanced pulmonary tuberculosis who were investigated, 71 showed alterations consistent with a diagnosis of right heart strain. It was determined that measurement of the circulation time, venous pressure and water balance was of little value in diagnosing the condition, inasmuch as the majority of patients who were investigated showed normal values. Digitalization is of value in patients with right heart strain before signs of decompensation are evident. This treatment is usually applied before major surgery is considered, and digitalis is continued for some weeks following the operation. In some cases an improvement in the electrocardiographic abnormalities was observed following digitalis treatment. In this series, the glycosides rather than whole digitalis preparations were used.—*Die Herzschädigung bei Lungentuberkulose und ihre Behandlung mit Digitalisderivaten, H. Steinlin, Schweiz. med. Wchnschr., January 11, 1947, 77: 72.—(H. Marcus)*

Asthma and Tuberculosis.—Six case histories are given to illustrate coexistence of asthma and tuberculosis. That asthma may mask the progress of a tuberculous infection is of serious concern, in so far as the clinician may not realize that the symptoms attributed to asthma, such as transient fever, wheezing, night sweats and dyspnea, may in reality be due to an active tuberculous lesion. Several additional case histories, with serial chest films, are presented to indicate the type of tuberculous lesion in which asthmatic symptoms are most likely to occur: tuberculous tracheobronchitis, bronchostenosis and torsion of a bronchus. Because of the frequent appearance of asthma-like symptoms in tuberculosis, regular roentgenological examination should be made in all patients with asthma to prevent missing the more serious diagnosis of coexisting tuberculosis.—*Asthma and Tuberculosis J. G. Gerrits, Acta tuberc. Scandinav., 1946, 20: 236.—(P. Q. Edwards)*

Calcium Therapy.—The experimental and clinical experience with calcium in limiting exudative and allergic reactions forms the rationale of calcium therapy in pulmonary tuberculosis. It is felt that exudative and allergic phenomena frequently contribute to the clinical picture, and calcium injections have, therefore, been employed routinely as adjuvant therapy in the author's institution. Since 1927, 400,000 ampules of 10 to 20 per cent solutions of injectable calcium preparations have been used without serious reactions. Of the total, 350,000 injections were given intramuscularly, and only 4 infections were seen; 3 of these could be attributed to breaks in the technique. Twenty per cent calcium solutions are always given intravenously, and no serious consequences have ever been encountered. It is felt that the drug has been of definite value in reducing the exudative phase of the disease and in preventing or limiting pleural effusions. This applies to spontaneous pleural effusions as well as to effusions resulting from thoracoscopy and pneumonolysis, or to effusions occurring extrapleurally from extrapleural pneumonolysis. Any effect of the therapy on the blood calcium level is discounted because blood calcium determinations have shown that the calcium level is usually normal in pulmonary tuberculosis. Nevertheless it is felt that calcium therapy is helpful in reducing the number of fatal hemorrhages. Only 2 cases of fatal hemorrhage have occurred in 5,000 cases.—*Praktische Erfahrungen mit der parenteralen Calciumtherapie bei der Behandlung der Lungentuberkulose, H. Stöcklin, Schweiz. med. Wchnschr., January 11, 1947, 77: 85.—(H. Marcus)*

Acid-base Balance in Tuberculosis.—Changes in acid-base balance are rarely observed in pulmonary tuberculosis, unless the disease is extensive and terminal. When

kidney function is not normal, however, changes can be produced with relative ease by administration of acid or alkali. This study is concerned with 5 patients whose kidney function precluded adjustments in the acid-base balance by alterations in the urine. Acidosis and alkalosis were produced experimentally by administration of suitable drugs, and the influence of this on the blood and on the ventilation was observed. It was found that the oxygen saturation of the blood was only insignificantly altered by the presence of acidosis and alkalosis, but the carbon dioxide content and its partial pressure were profoundly affected. In acidosis these values are substantially lowered, whereas they increase with alkalosis. Acidosis increases pulmonary ventilation, whereas alkalosis depresses it. This is purely a function of the blood pH and does not depend on the carbon dioxide content of the blood, as used to be thought. Of interest is a marked increase in the dead space with acidosis, and its decrease with alkalosis. Increase in the dead space is in itself a bar to efficient ventilation, so that the presence of acidosis creates a vicious cycle. The total results in the 5 patients indicated that with moderate degrees of acidosis and alkalosis compensation is possible, and a constant pH is maintained. When the chemical disturbances in the blood are more profound, the body does not sacrifice its respiratory function for the sake of maintaining a constant pH, and a new, though inefficient, equilibrium is established at a lower or higher pH. This phase is called the phase of decompensated acidosis or alkalosis, respectively.—*Lungenfunktion und Säure-Basen Gleichgewicht des Blutes, P. H. Rossier & K. Wiesinger, Schweiz. med. Wchnschr., January 11, 1947, 77: 55.*—(*H. Marcus*)

Sarcoidosis and Miliary Tuberculosis.—Sarcoidosis is of growing interest to the sanatorium physician because of its relative frequency in his practice. Possible relationship between sarcoidosis and tuberculosis has prompted a great deal of discussion, the present report adding one more case history to support the belief that the two diseases are in some way varying aspects of the same pathogenetic agent. In this case, histological studies of autopsy specimens revealed transitions from proliferative lesions typical of sarcoidosis to lesions with necrosis and caseation, typically tuberculous in character, supporting the view that miliary tuberculosis in this case was a consequence of the earlier sarcoidosis. The patient had been BCG vaccinated, producing a positive Mantoux reaction to 0.1 mg. of tuberculin eighteen months before the first sign of sarcoidosis, at which time his tuberculin test was negative to 1.0 mg. He remained negative throughout the course of his disease, during which the sarcoidosis progressed from the initial hilar adenopathy and subchronic uveitis, to granulomatous lesions in the nasal mucosa, tonsils, epipharynx and pharynx, peripheral lymph nodes throughout the body, miliary densities in the lungs and finally death from miliary tuberculosis.—*Lymphogranulomatosis benigna (Schaumann) Complicated by Miliary Tuberculosis in a BCG Vaccinated Patient, L. Ehrner, Acta tuberc. Scandinav., 1946, 20: 138.*—(*P. Q. Edwards*)

Tonsillogenic Miliary Tuberculosis.—The disease started in the 4 cases reported with subacute tonsillitis only later diagnosed as tuberculous. The lesions ulcerated within a few weeks and spread to the oral and pharyngeal mucosa. The lymph nodes of the neck rapidly became involved, and tuberculous abscesses formed in 3 instances. All cases occurred in young soldiers and terminated in miliary tuberculosis one and one-half to three months after onset of the disease. Two cases were autopsied and the findings suggested the tonsillary tuberculosis as the primary focus.—*Über tuberculöse tonsillogene Sepsis, H. R. Gadolin, Acta oto-laryng., 1946, 34: 495.*—(*B. Gerstl*)

Spirography in Bilateral Collapse.—At the Miguel Pereira Hospital at Rio spirography has shown a definite advantage over spirometry in the selection of patients for bilateral

collapse. A metabolism apparatus is used rather than Knipping's spirograph. Five cases are reported to demonstrate the value of the method. Spirometry reveals only vital capacity but does not reveal the breathing reserve, although the latter may contraindicate operations. This was the case in 3 of 6 instances presented.—*A reserva respiratória na colapsoterapia bilateral, R. Fernandes & S. Rubens Barboza, Clín. tisiol., July-September, 1946, 1: 203.*—(*A. A. Moll*)

Lung Volume.—When exercise or a decreased oxygen tension in the inspired air make special demands for increased oxygen consumption, increase in the rate and depth of respiration ensues. An increased minute volume results. A third mechanism for increasing oxygen intake during periods of stress is discussed in this paper, namely the increase of lung volume during exercise. It is estimated that lung volume can increase from 55 to 70 square meter by about one-third. Such a mechanism has been postulated in the past, but experimental proof was lacking. The author has conducted numerous experiments designed to measure lung volume. In one set of experiments the entire subject, except his head, was enclosed in a body-plethysmograph and the increase in lung volume during exercise was measured directly. The subject could also be connected with spirometers from which air of any desired oxygen concentration was breathed. These results confirm the increase of lung volume when oxygen under lowered pressure is breathed. In another type of experiment, a recording thoracometer is used; although this does not measure lung volume it gives an accurate graphic record of changes in the size of the thorax from which lung volume can be calculated. Animal experiments support the theory that under resting conditions certain areas of the lung are closed wholly or in part to gas exchange. This may affect whole lobules or only primary lobules, or territories supplied by certain bronchioli, and these areas become opened up when lung volume increases. Several interesting theories have been advanced as to the mechanism responsible for opening such incompletely ventilated portions of the lung. The smooth muscle which is abundantly distributed throughout the lung plays an important rôle. This muscle is not only distributed in circular fashion around bronchi and bronchioles, but it is also found in the alveolar septa, especially in the pillars between the alveoli. This smooth muscle acts in harmony with the skeletal muscles of respiration. When increased demands for oxygen cause greater effort on the part of the skeletal muscles, their increased tone becomes manifest by a larger basic thoracic circumference. The result is a decreased tone of the smooth muscle within the lung, and previously unaerated areas are thus opened up. Conversely, with the subject at rest and breathing oxygen under normal tension, decreased tone of the skeletal muscles, and a smaller basic thoracic circumference coexist with increased tone of the smooth muscle, and portions of the lung become closed off. Adrenergic stimuli are well known to relax smooth muscle within the lung, and we may assume that cholinergic and vagotropic influences cause increased tone of the pulmonary smooth muscle. Another theory that has been advanced concerns the concentration of carbon dioxide locally within the closed lobules. As a lobule is closed off, the carbon dioxide concentration increases steadily as oxygen is resorbed. At a certain critical concentration the smooth muscle relaxes and the lobule again becomes aerated. There is some experimental evidence to support this "local bronchomotoric reaction" of Engelhardt. The preceding considerations find important applications in the understanding of the pathological physiology involved in bronchial asthma and other asthmatoid states. Because of an antagonism between the smooth and the skeletal muscles of respiration, the lung volume is increased at rest. Even so the oxygen concentration is below normal because smooth muscle spasm within the lung closes off large areas from proper ventilation. When a bronchodilator spray is applied, smooth muscle spasm ceases. The closed off areas

again become ventilated, and with proper synchronism between skeletal and smooth muscle lung volume actually decreases with exercise, rather than increases, to the benefit of the subject.—*The Regulation of the Lung Volume and Its Disturbances, F. Verzár, Schweiz. med. Wchnschr., Sondernummer, September 16–21, 1946, 76: 932*—(*H. Marcus*)

Pulmonary Function Tests.—The occasional patient with less than 50 per cent vital capacity in whom surgery was nevertheless carried out and who showed no dyspnea except after exercise, suggested that the vital capacity is not an accurate indicator of pulmonary function and that ability of the lung tissues to diffuse oxygen is a large factor in pulmonary function. Blood oxygen saturation changes occur only when clinical evidence of anoxia is likewise present; hence some other means of determining permeability of alveolar tissues seemed indicated. To estimate pulmonary function, two factors should be determined: ventilatory function and diffusion function. The former is the resting minute volume of ventilation, and the maximum breathing capacity for one minute. Ventilatory reserve is maximum breathing capacity divided by minute volume, which is about 20 in normal males, and 13 in normal females. (Normal figures given by Cournard, Richards and Darlington: resting minute ventilation: 7.5 liters, maximum breathing capacity in males: 154 liters, females: 100 liters.) Oxygen diffusion is measured by the twenty-second use of a rebreathing bag containing a liter of air. Mean values for 23 normal males after a standard exercise test were 7.95 volumes per cent (±0.851), for 25 normal females 8.30 (±0.74). By this method, an oxygen volume per cent up to 9.5 was considered a good diffusion, above 10 was an indication of impairment of permeability and diffusion which would suggest caution in contemplation of major thoracic surgery. As a rule, there is no constant relationship between oxygen diffusion and ventilatory reserve; both factors should be ascertained and considered seriously before surgery. Tidal air bears no relationship to ventilatory reserve or the diffusion of oxygen. Measurements of alveolar air are most unreliable as an indication of oxygen diffusion because of the unstable conditions in the alveoli. A study of 41 patients is presented in this paper, analyzing the estimations of pulmonary function by use of both ventilatory reserve and diffusion of oxygen. Eight complete case histories are given, with data on pulmonary function both before and after major thoracic surgery.—*The Value of Pulmonary Function Tests in Thoracic Surgery for Pulmonary Tuberculosis, G. G. Ornstein, Quart. Bull. Sea View Hosp., October, 1946, 8: 279.*—(*P.Q. Edwards*)

Oxygen and Carbon Dioxide Diffusion.—Equipment to measure the diffusion of oxygen in the alveoli consists of a rebreathing bag and a simplified oxygen and carbon dioxide analyzer. The analyzer which has an accuracy of ±0.1 per cent is far easier to operate than the more accurate Henderson-Haldane apparatus. A detailed description of this analyzer is given. After a standard exercise test, subjects are connected for twenty seconds with a rebreathing bag containing one liter of air. In 22 normal adult males, the oxygen volumes per cent of 20.93 originally in the bag was reduced to a mean volume of 7.95 ± 0.851; carbon dioxide of 0.03 volumes per cent was increased to 8.09 ± 0.436. In 25 normal females, the mean oxygen volume per cent was 8.30 ± 0.714; carbon dioxide volume per cent was 7.70 ± 0.497. An oxygen volume per cent up to 9.5 is considered good diffusion of oxygen; above 10 is an indication of impairment of permeability and diffusion.—*Simplified Equipment for Estimating the Diffusion of Oxygen and Carbon Dioxide in the Lungs, G. G. Ornstein, Quart. Bull. Sea View Hosp., October, 1946, 8: 303.*—(*P. Q. Edwards*)

Phrenicectomy.—Of all operations on the phrenic nerve, phrenicectomy is the only one furnishing the long, continued rest required for the healing of cavities. Patients must be selected with care. Among some 800 chest

operations performed in a two-year period at the Miguel Pereira Hospital at Rio, only 25 were phrenicectomies, and in 3 cases these were associated with a pneumothorax. In 18 cases the operation was on the right side, and in 7 on the left. The age ranged from 12 to more than 50 years in 2 cases. The clinical type of the disease was ulcero-fibro-caseous in 10, ulcero-caseous in 10 and ulcero-fibrotic in 5. No statement can be made as to remote results since all patients are still under observation and a number of them were operated less than a year ago. The operation was at first limited to basal cases, but it is now being extended to lesions higher up.—*Limites e indicações da frenicectomia, R. Fernandes, J. M. Castello Branco, J. Batista Rocha & J. Martins dos Santos, Clín. tisiol., July-September, 1946, 1: 185.*—(*A. A. Moll*)

Results of Thoracoplasty.—This is a review of 200 patients who underwent thoracoplasty for different types of tuberculosis. In this consecutive series, 188 patients were female and 12 were male. All together, 364 (or 1.8 stage per patient) stages were performed. Bilateral lesions were encountered in 98 cases. All patients had cavities. The majority, 77.5 per cent, were between the ages of 20 and 39, 11 per cent between 15 and 19, and one case was over 60 years. The indications for thoracoplasty depend upon the character of the lesions. Primary thoracoplasty should be done for apical cavities with fibrotic wall. All active lesions are perfect indications for thoracoplasty, provided that they are localized in the upper half of the lung field. Giant cavities give poor results, unless cavernostomy and phrenic exeresis are done previously. In minimal apical lesions, one stage is generally sufficient to control the disease, but lobectomy is preferable, provided the respiratory capacity is adequate. Giant cavities with a ball valve mechanism and retention of secretion as well as bronchiectasis are formal contraindications. The social status of the patient should not be neglected. If prolonged conservative treatment is not feasible, thoracoplasty should be done early. The operative risks are directly related to the extent of the lesion. Patients under 15 and over 50 years give poorer results than those between 15 and 50. Pre- and postoperative care are as important for final satisfactory results as the surgical procedure itself. A complete cardiac and respiratory examination, including electrocardiogram and bronchoscopy, should be routine preoperative procedure. The author describes a modification of the classical thoracoplasty which he has used in one-fourth of his series. Subperiosteal resection of the third rib is followed by a total resection of the second and first ribs in their entire length, including the periosteum and the fixation of the second intercostal muscle to the paravertebral muscles through a hole in the third intercostal space. This procedure prevents regeneration of the two upper ribs and permits a postponement of the second stage until complete postoperative recovery has taken place and so lowers the mortality rate. In 150 consecutive cases in which the classical technique was used, 283 stages (1.9 stage per patient) were necessary, whereas in 50 consecutive cases with the new technique, only 81 stages (1.6 per patient) had to be done. Moderate apicolysis was done in all cases but in those with giant cavities. Postoperatively, six months of rest was considered minimal requirement. The results were: conversion of sputum to negative and apparent stabilization of the disease in 139 (69.5 per cent). Thirty-three patients, or 16.5 per cent, died. The others were improved or were lost sight of. The mortality in the unilateral cases was 14 (13.7 per cent), in the bilateral cases 19 (19.4 per cent). Four cases (2 per cent) had minimal lesions and all were cured. Fifty cases (25 per cent) were moderately advanced. Of those, 46 (92 per cent) were cured and 1 (2 per cent) died. There is a distinctive increase in mortality during the second and third stage and especially after revision-thoracoplasty. After the first stage, there were 10 deaths among 200 operations; 8 were operative and 2 late deaths. In the second stage, there were 18 (12.1 per cent) deaths among 148 operations, of which 12 were immediate and 6 late. After the

third stage or revision, there were 5 (31.2 per cent) deaths in 16 cases. The deaths have considerably decreased since aspiration-bronchoscopy and blood transfusions during the operation have been routinely employed. The author's modified technique shows a definite superiority over the standard technique. There were only 3 (6 per cent) deaths in his series of 50 with 84 per cent of conversion of sputum, whereas in the series of 150 operated on by the old technique, only 64 per cent were stabilized and 30 (20 per cent) died. —*Estado actual de la toracoplastia en el tratamiento de la tuberculosis pulmonar, J. L. Gomez Pimienta, Rev. méd. d. Hosp. gen. Mexico, January, 1946, 8: 303.*—(*W. Swienty*)

Resection for Pulmonary Tuberculosis.—The author relates his experiences of twelve months' work with Overholt in Boston. Lobectomy or pneumonectomy have decided advantages over thoracoplasty in selected cases of tuberculosis. There is immediate conversion of sputum and complete extirpation of the focus. The rapid cure means great economic advantage to society. Disadvantages are: the high mortality (which has decreased in the last 100 consecutive cases to only 3 per cent); the postoperative complications (6 per cent spread and 3 per cent broncho-pleural fustulae) and the reduction of lung function by emphysema. This can be remedied by subsequent thoracoplasty and phrenicectomy. Definite indications for radical surgery are limited to: residual cavities after thoracoplasty; tuberculoma; basal tuberculosis; insufflated cavities limited to one lobe and uncontrollable hemoptysis. For all other types, radical surgery for tuberculosis is still in its experimental stage.—*La cirugia radical en el tratamiento de la tuberculosis pulmonar, F. E. Tricerri, An. de cir., September, 1946, 11: 210.*—(*W. Swienty*)

Pneumonectomy.—There is a place for pulmonary resection in the treatment of pulmonary tuberculosis, not in competition with established relaxation measures, but in a well defined group of patients without reasonable hope of cure by collapse therapy. Most authors agree on the following indications for resection: (*1*) extensive bronchial stenosis, (*2*) tuberculoma, (*3*) cavities failing to close under adequate thoracoplasty, (*4*) lower lobe cavities not amenable to collapse treatment, (*5*) tuberculous bronchiectasis. A series in which lobectomy was performed in preference to thoracoplasty despite the possibility of performing thoracoplasty, yielded results two to four years postoperatively that compare unfavorably with those obtained by thoracoplasty in similarly suitable cases, both in terms of mortality rate and sputum conversion. The hazards of resection are due to: (*1*) the fact that tuberculosis is not limited to the parenchymal tissue of one lobe alone nor, in the majority of instances, even to one lung; (*2*) overdistension occurs in remaining lobes with reactivation of apparently healthy tissue in which there was quiescent or inactive disease; (*3*) bronchogenic spread occurs in a relatively high percentage of patients; (*4*) tuberculous empyema, either pure or mixed, is a frequent complication. A series of 18 patients is presented in which pneumonectomy was performed in 4 and lobectomy in 10 for one or more of the above indications. In 4 additional cases tuberculosis was not present or went unrecognized at the time of operation. Seven died, 7 are still living with active tuberculosis, and 4 have no complications to date. Tuberculous empyema occurred in 5 of the 7 dead, three to six weeks postoperatively. Tuberculous pericarditis caused death in one patient in whom a contralateral lesion was improving one year postoperatively. Circulatory failure occurred on the third postoperative day in the remaining death, but a contralateral spread was seen at autopsy. Exacerbation or spread of pulmonary tuberculosis was a factor in 4 of the 7 deaths and late extension to the pericardium was seen in another. Overdistension of the remaining lung tissue was apparently responsible for reactivation of tuberculous lesions in 4 patients including one of the fatal cases. Of the 7 remaining alive, one will probably die; the others seem to be doing satisfactorily. While

it is possible that removal of grossly involved lung tissue (eliminating toxemia) may help other lesions, overdistension of the remaining lung is hazardous and Overholt's suggestion to tailor the chest to fit the lung is not always immediately practical. Two case histories are presented in detail.—*Lobectomy and Pneumonectomy in Pulmonary Tuberculosis, D. Carr & J. S. Harter, Dis. of Chest, September-October, 1946, 12: 387.*—(*K. R. Boucot*)

Cavernostomy.—Cavernostomy has been used sporadically for many years. Its present status is highly equivocal since the procedure is employed in such small, different series of cases. A review of 15 cavernostomies with apparently favorable results in 8 patients is presented. Indications are varied; a large cavity in a lung not suitable for thoracoplasty or resection was the most common situation in which cavernostomy was performed. After localization of the cavity by X-ray markers or lipiodol and methylene blue injection into the periosteum overlying the cavity, an incision was made for a 2 inch subperiosteal resection of the rib. Iodoform packing was used whenever free pleura was encountered and incision of the cavity was a second-stage procedure. Otherwise, the cavity was unroofed by removing the required number of rib segments to afford free drainage. High postoperative temperatures, possible because of autotuberculinization, for one to two weeks were usually seen. Tubercle bacilli disappeared from the wound secretions usually within the first week; sputum conversions, when obtained, became apparent in the first six weeks. Operative mortality was 2 out of 15.—*Cavernostomy, L. A. Hochberg, I. Fink & W. M. Chardack, Quart. Bull. Sea View Hosp., October, 1946, 8: 343.*—(*P. Q. Edwards*)

Pleurisy with Effusion.—Pleurisy with effusion when cause is in doubt is believed to be tuberculous. It is sometimes followed by frank tuberculosis in the lungs or other organs. Present study is based on 233 patients who had pleurisy with effusion, from the Ealing Chest Clinic, 1937-1944. Forty-three had X-ray evidence of parenchymal pulmonary tuberculosis and were excluded. The remaining 190 were kept under constant observation in the clinic for maximum periods up to the end of 1945, with the exceptions that one patient was lost after two and one-half years, and 8 ceased to attend, of whom all are known to be alive and well and at work. Of the 190, 40 have developed secondary tuberculosis, and 6 have died. The relative incidence of secondary tuberculosis was approximately the same in each age group. The case fatality rates were also evenly distributed. Of the 40 patients, 18 were male, 22 female. Approximately half of the cases of pulmonary tuberculosis developed within the first year after the initial pleurisy. No cases occurred after five years. Of the tuberculous lesions which developed, 15 per cent were extrapulmonary. The death rate for the five-year period was 3.5 per cent.—*Prognosis of Primary Pleurisy with Effusion, B. C. Thompson, Brit. M. J., April 12, 1947, 4501: 487.*—(*R. W. Clarke*)

Renal Tuberculosis and Primary Infection.—Using erythema nodosum as the timing point for primary infection, it has been shown by others that tuberculous meningitis occurs most often within two months, pleuritis within six months, bone and joint involvement within two years and pulmonary involvement within five years. Genito-urinary tuberculosis seems to be an exception to this rule. An analysis of 292 cases of renal tuberculosis showed 55.8 per cent to be in men; 18 per cent showed bilateral involvement at the first examination. The time interval from erythema nodosum and pleuritis to the appearance of renal tuberculosis was less than one year in 5 cases, up to five years in 18 cases and more than fifteen years in 17 cases. There were also long intervals between other manifestations of tuberculosis and renal involvement; in 55 cases the interval was more than five years and in 21 it was more than fifteen years. One-half of the patients who had another manifestation of tuberculosis before the renal had more than one (up to 4 or 5) such manifestation. In this group there was involvement of the pleura in

21 per cent, of the bones and joints in 22 per cent and of the lungs in 25 per cent. This discrepancy between the rapidity of onset in renal tuberculosis as compared to other manifestations of the disease may be explained in part by the slow evolution. In 44.8 per cent there was an interval of more than one year and in 25 cases more than five years between the first appearance of symptoms and the establishment of the diagnosis. It is likely that both kidneys are involved by hematogenous spread soon after the primary infection. There is then a very slow evolution of the disease.—*The Relation between Renal Tuberculosis and Primary Infection, H. J. Ustvedt, Tubercle, February, 1947, 28: 22.—(A. G. Cohen)*

Urogenital Tuberculosis.—A pavilion of 6 beds restricted to the care of male patients with urogenital tuberculosis has been opened at the sanatorium at Petit-Arbois, near Marseilles, to receive patients from all over France. Old stabilized ulcero-caseous unilateral renal tuberculosis will receive immediate surgical treatment, but patients will be prepared by several months of sanatorium care if the lesions are fresh and unstable. Further sanatorium care will be given after operation to enable fistulas to close, bladder residuals to heal, and to avoid the appearance of other tuberculous localizations. A few instances of light unilateral renal involvement with bacilluria but without open ulceration may heal on medical care alone. Specialized sanatorium care may also prolong the life and improve the general health of patients with bilateral renal tuberculosis. Since tuberculous epididymitis is only the visible evidence of more extensive bladder and prostatic involvement, its removal is chiefly a cosmetic procedure which should be preceded and followed by adequate sanatorium care.—*Lutte contre la tuberculose urogénitale, B. Fey, Presse méd., March 22, 1947, 55: 210.—(E. Bogen)*

Genital Tuberculosis.—A case of atresia of the vagina in a 19-year-old, single, Negro woman, is presented. Because of anticipated marriage, she wished to have a normal vagina constructed. There had been amenorrhea and a malodorous discharge for many years; otherwise she had been in good health. A Wharton technique was done and a diagnosis of chronic granulomatous endocervicitis, probably tuberculous, was made. X-ray films of chest and abdomen were normal, likewise were intravenous pyelograms. In view of the probable tuberculosis of the tubes as well as the uterus, four days later the patient was operated upon. A small uterus, both tubes and right ovary were removed. No tubercules were found in the peritoneum. Adnexal structures on both sides were matted together; both tubes were thickened and nodular. The bowel or bladder was not adherent. Evidence of tuberculosis was found in the adnexal structures. The vagina continued to heal except for the extreme apex. It was felt that the operative procedures were justified because of the opportunity of removing the only known focus of infection. The apex of the vaginal vault did become constricted and occasionally drains a small amount of mucopurulent material.—*Genital Tuberculosis with Atresia of the Vagina and Amenorrhea, R. T. Schmidt & R. L. Faulkner, Am. J. Obst. & Gynec., April, 1947, 53: 695.—(R. W. Clarke)*

Tuberculosis of Uterus.—Only 191 cases of tuberculosis of the cervix have been recorded, of which 44 were thought to originate in the cervix itself. Pathogenesis of the lesion is by hematogenous dissemination from a visceral focus or by an ascending infection from a primary genital lesion. Diagnosis of the disease is made by pathological examination of the resected cervix, in which tubercles are seen in the glandular stroma and in which acid-fast bacilli may be demonstrated by proper staining. Clinically, the patient may present symptoms and signs of a chronic cervicitis; pelvic examination reveals signs consistent with carcinoma: a large, firm, ulcerated cervix, fixed in position. Tuberculosis of the cervix in a 51-year-old married woman is reported in whom a subtotal hysterectomy had been performed some eighteen years

formerly because of uterine fibroids. Preoperative diagnosis was procidentia, although after removal of the cervix, histological examination showed typical tubercles in areas of chronic inflammation associated with tubercle bacilli. Her chest film revealed scarring in the apices. Complete urological studies failed to reveal any evidence of tuberculous infection.—*Tuberculosis of the Cervix Uteri, G. L. Beckner, Ann. West. Med. & Surg., April, 1947, 1: 74.*—(*P. Q. Edwards*)

Tuberculosis of Spine.—Tuberculosis of the spine in children should be treated by fusion of the posterior elements of the vertebral bodies involved to allow healing with minimal deformity. The degree of kyphosis will depend upon the amount of involvement in the cancellous bone. This orthopedic procedure is usually performed in stages—hemifusion—to reduce postoperative complications. In so far as tuberculosis of the spine represents only one aspect of a generalized disease, vertebral foci, if not treated, may continue to exist after the pulmonary disease is controlled. Spinal fusion is the treatment of choice not only to eliminate active foci but to prevent deformities due to destruction of vertebral bodies.—*Treatment of Tuberculosis of the Spine in Children, W. E. Swift, Quart. Bull. Sea View Hosp., October, 1946, 8: 360.*—(*P. Q. Edwards*)

Tuberculosis of Brain and Meninges.—Tuberculoma was once the most common intracranial tumor. It is now relatively rare. It is an expanding lesion. There are signs both of increased intracranial pressure and of focalization. The chief conditions from which it must be differentiated are tumor and abscess. Although operation increases the risk of tuberculous meningitis, it must, nevertheless, be done. In 6 of the authors' cases subjected to operation, there were 4 recoveries; 2 patients died from meningitis. Of 25 cases, one-half were over 10 years old. The onset is insidious with the prodromal period ranging from seven days to six months. Neurological signs may be divided into five groups: (*1*) Meningeal irritation; these signs may be absent in infants. (*2*) Increased intracranial pressure, characterized by headache, vomiting and increased spinal fluid pressure. (*3*) Mental changes, consisting or irritability, apathy and stupor. (*4*) Epilepsy; 8 of 25 cases had convulsions; this is more common in children. (*5*) Focal signs; these are very common, particularly those related to the innervation of the eye muscles. There was an abnormal plantar response in 16 cases. Pathological studies show extensive vascular changes in the meninges. These result in secondary changes in the brain tissue. Either the protein or the cell count in the cerebrospinal fluid, usually both, is elevated. The pleocytosis is chiefly lymphocytic though rarely 100 per cent. There is a progressive fall in chlorides particularly in the latter stages. However, there is no pathognomonic level. The condition must be differentiated from pyogenic meningitis, poliomyelitis and brain tumor. In differentiation from pyogenic meningitis, a history of tuberculosis elsewhere in the body or in the patient's family is of great importance. When in doubt, treatment should be for the pyogenic condition.—*Some Clinical and Pathological Aspects of Tuberculosis of the Central Nervous System, H. V. Smith & P. Daniel, Tubercle, April, 1947, 28: 64.*—(*A. G. Cohen*)

Treatment of Lupus Vulgaris.—One hundred and fifty cases of lupus vulgaris were treated for at least four months with calciferol in daily doses of 100,000 units. Prior to calciferol, the best forms of treatment had resulted in failures in 20 per cent of cases. The new treatment has not changed these figures, but it is a great advance in that it is much simpler and has shortened the time of treatment by one-half to two-thirds. Previous X-ray or radium treatment made no difference in the results. Intolerance to the drug was encountered in 23 per cent of cases. The addition of calcium was found to be unnecessary. The addition of vitamin B was without effect in preventing reactions. Later in the study, calciferol, in daily doses of 500,-

000 to 3,000,000 units, was given to patients with pulmonary tuberculosis. No beneficial effects were noted.—*Calciferol in Tuberculosis, P. J. Feeny, E. L. Sandiland & L. M. Franklin, Lancet, April 5, 1947, 1: 439.*—(*A. G. Cohen*)

Antibiotic against Mycobacteria.—An actinomycete (A-82) formed an antibiotic which when tested against more than 60 species, including more than 20 genera of bacteria, inhibited only *M. smegmatis, M. phlei* and a nonpathogenic, rapidly growing strain of *M. tuberculosis*, variety *hominis* No. 607. A pathogenic *M. tuberculosis*, variety *bovis*, was not inhibited. Methods for producing the crude antismegmatis factor were outlined. It was thermostable and more active in alkaline media than in acid media.—*An Antibiotic (Anti-Smegmatis Factor) Produced by an Actinomycete, Specifically Inhibiting Species of Mycobacterium, A. Kelner & H. E. Morton, Proc. Soc. Exper. Biol. & Med., November, 1946, 63: 227.*—(*F. B. Seibert*)

Fusarium Inhibiting Tubercle Bacilli.—Of a large number of fungi, recently isolated from a variety of sources, only one, a *Fusarium, Sp.*, inhibited growth of the tubercle bacilli. An alundun capsule was introduced into an Erlenmeyer flask containing Long's media and the fluid inside the capsule was inoculated with the fungus while the outside fluid was inoculated with a recently isolated strain of virulent tubercle bacilli. The inhibiting substance passed through fritted glass filters and Mandler filters but was partially inactivated by passage through Seitz filters. The crude filtrate was active up to a dilution of one-twentieth and withstood heating to 100°C. for fifteen minutes without loss of activity.—*Growth Inhibition of Tubercle Bacilli by Fusarium Sp., C. H. Boissevain, Proc. Soc. Exper. Biol. & Med., December, 1946, 63: 555.*—(*F. B. Seibert*)

Streptomycin.—A review of the American studies on streptomycin, citing 43 references (with several typographical errors), but no original work.—*La streptomycine, L. de Gennes & Minne, Presse méd., March 22, 1947, 55: 202.*—(*E. Bogen*)

Streptomycin in Experimental Tuberculosis.—The *in vitro* retarding influence of streptomycin on tubercle bacilli is accentuated in poor nutrient media, and diminishes one hundred-fold in good media. In egg-yolk-glycerol medium 1,000 units of streptomycin were required to retard the growth of a 0.01 mg. inoculum of virulent tubercle bacilli (human type). Twenty thousand units injected intravenously into guinea pigs fifteen minutes before bleeding were required to inhibit completely the growth of human type tubercle bacilli planted in media to which the blood was added; 10,000 units of streptomycin left in contact with 10 mg. of virulent tubercle bacilli in a saline suspension for one week did not destroy the organisms, and had no effect after one week's contact with 0.01 mg. per cc. of tubercle bacilli suspended in blood. In 4 guinea pigs inoculated intravenously with 1 mg. of tubercle bacilli and treated immediately with 9,000 units daily subcutaneously for twenty-eight days, the average survival period was thirty days, compared to eighteen days for 4 control animals. One pig survived forty-three days, dying fifteen days after treatment was stopped; it showed a heavy growth of tubercle bacilli in its organs. Streptomycin definitely retards the course of tuberculosis in guinea pigs, but the effect lasts only as long as the treatment continues, and there is no destruction of all the tubercle bacilli by the amounts of the drug used. No accumulation of the drug in the tissues was found, nor adsorption of the drug by the tubercle bacilli or tubercles. Up to one-half million units of streptomycin per kilogram daily subcutaneously did not eradicate the infection in mice. It is concluded that the drug is not tuberculocidal in reasonable amounts, but that it interferes with the anabolism of the bacilli, retarding growth. Even this requires high concentrations of the drug, and such high levels can be obtained *in vivo* only briefly with the present potency of

material. In clinical tuberculosis the reproduction and growth of tubercle bacilli is irregular and occurs over long periods of time. The applicability of streptomycin to human tuberculosis is limited.—*The Tubercle Bacillus and Fundamental Chemotherapeutic and Antibiotic Action, H. J. Corper & M. L. Cohn, Yale J. Biol. & Med., October, 1946, 19: 1.—(A. A. Cohen)*

Streptomycin Resistance of Tubercle Bacilli.—Tubercle bacilli isolated from guinea pigs inoculated with sputum, urine or material obtained on gastric lavage from tuberculous patients, who were being treated with streptomycin, were as resistant as cultures isolated directly from the same materials. Cultures of tubercle bacilli from patients receiving streptomycin retain their resistance to the drug even after residence in guinea pigs for ten weeks or more and subsequent maintenance on glycerinated egg-yolk-agar for many weeks.—*Persistence of Resistance of Tubercle Bacilli to Streptomycin during Passage through Guinea Pigs, A. G. Karlson, W. H. Feldman & H. C. Hinshaw, Proc. Soc. Exper. Biol. & Med., January, 1947, 64: 6.—(F. B. Seibert)*

Quantitative Effect of Streptomycin.—A simple, safe and accurate method is described for the quantitative estimation of the growth of *Mycobacterium tuberculosis* based upon turbidimetric measurements in Dubos medium. This procedure can be applied to measuring the rate and amount of growth of *M. tuberculosis* in various media, as affected by the presence of streptomycin. The turbidity was correlated with the weight of cell material and with the number of viable cells as determined by plate counts of viable bacteria in a suspension. A standard curve was prepared.—*Quantitative Measurement of Growth of Mycobacterium tuberculosis: Effect of Streptomycin, Dorothy G. Smith, Proc. Soc. Exper. Biol. & Med., January, 1947, 64: 36.—(F. B. Seibert)*

Streptomycin and Diasone in Experimental Tuberculosis.—Both streptomycin and diasone have shown some degree of therapeutic effectiveness in the treatment of experimental tuberculosis in guinea pigs. When given together they exert even greater effect, suggesting a synergistic or additive effect. Both are more effective in suppressing tuberculous infection by the institution of treatment within a few days after inoculation with virulent tubercle bacilli than in the treatment of established lesions developing two weeks or longer after infection has been established.—*Streptomycin and Diasone in the Treatment of Experimental Tuberculosis of Guinea Pigs, F. T. Callomon, J. A. Kolmer, Anna M. Rule & A. J. Paul, Proc. Soc. Exper. Biol. & Med., November, 1946, 63: 237.—(F. B. Seibert)*

BCG Sensitivity to Streptomycin.—In order to test the effect of streptomycin on BCG, two series of tests were made. The drug was added in varying dilutions to Sauton fluid to which a vigorous culture of BCG was added. Daily inspection of the cultures revealed that normal growth took place in bottles containing streptomycin one unit per cc., marked inhibition in 2 units per cc. and barely visible growth in 5 units per cc. After seventeen days' incubation, the cultures were dried and weighed, showing results corresponding to the visible results. Secondary cultures were then made, which showed growth in all cases, although the number of colonies decreased as the streptomycin concentration increased. In the second experiment BCG suspensions in diluted Sauton fluid (BCG vaccine) were mixed with equal portions of streptomycin solutions making concentrations from 5 to 100 units per cc. After time intervals from one-half to twenty hours at room temperature, the mixtures were centrifuged and cultures were made from the sediment. Only after twenty hours' exposure in concentrations of 50 and 100 units per cc. were bactericidal effects observed. The bactericidal effect was markedly less pronounced on resting cells than cells undergoing growth.—*The Sensitivity of BCG to Streptomycin, J. Bøe & Th. M. Vogelsang, Acta*

tuberc. Scandinav., 1946, 20: 158.—(*P. Q. Edwards*)

Clinical Results with Streptomycin.—This is the initial report, from a U. S. Naval Hospital, on 37 patients with moderately and far advanced pulmonary tuberculosis who were treated for 120 days with streptomycin. These patients were chosen from over 1,800 tuberculous patients as fulfilling the strict criteria of having exudative type lesions which had progressed during three months of strict bed-rest and in whom other therapeutic measures were contraindicated. By the end of the course of treatment, 7 were considered ready for major surgery, 3 were nearly ready and 6 had improved to such an extent that no collapse measures were deemed necessary. Clinically the best progress was made during the first month of treatment and the reactions were generally mild and of the usual nature. During the first month following cessation of streptomycin the relapse rate was 16 per cent.—*Report on Navy Cases in Joint Army, Navy and Veterans Administration Study of Streptomycin in the Treatment of Pulmonary Tuberculosis, Bumed News Letter, U. S. Navy, April 11, 1947, Vol. 9, No. 8.*—(*E. A. Rouff*)

Promizole and Streptomycin in Tuberculosis of Skin.—Twelve cases are reported who had various forms of cutaneous tuberculosis consisting of lupus vulgaris (3), scrofuloderma (6), tuberculosis cutis colliquativa (1), erythema induratum (1) and tuberculosis miliaris disseminata faciei (1). Seven of the 12 patients received promizole and 5 received streptomycin; 3 of the patients who had received promizole were treated subsequently with streptomycin. The average dose of promizole was from 8 to 10 g. daily, administered orally. Streptomycin was usually given in doses of approximately 1 g. per day as streptomycin salt in an aqueous solution. Approximately 125 mg. was injected intramuscularly every three hours. The total dosage per course of treatment varied from 15 to 128 g. Of those receiving only promizole, one case of scrofuloderma was unimproved and one considerably improved; a case of lupus vulgaris was unimproved, and a case of erythema induratum (legs) was temporarily healed, but partially relapsed a year later. Of those receiving only streptomycin 3 cases of scrofuloderma were improved, one doing very well. Relapses occurred, however, except in the latter case. A case of tuberculosis miliaris disseminata faciei developed temporary remissions after each of three courses of streptomycin treatment. And, lastly, the case of tuberculosis cutis colliquativa did well despite inadequate treatment. Of the 3 cases receiving promizole first and streptomycin later, one case of lupus vulgaris, failing to improve on promizole, did very well on streptomycin, another case of lupus gave indifferent results and a case of scrofuloderma did fairly well but with a tendency to relapse. It is probable that the results of treatment of early primary infections, such as inoculation tuberculosis of the skin will be better than in the treatment of long-standing organized processes or extensive "id" reactions in which few tubercle bacilli are present. The possibility that, in the patients with sinuses and ulceration, the drugs used might have been effective primarily against the secondary bacterial invaders has not been overlooked, but this appears improbable because of the limited range of action of these substances and the failure of other antibacterial agents in similar circumstances. Streptomycin, although not the ideal agent for the treatment of cutaneous tuberculosis, is of enough value to warrant further investigation and use. (Illustrated in color)—*Treatment of Various Types of Cutaneous Tuberculosis with Promizole and Streptomycin, P. A. O'Leary, E. T. Ceder, H. C. Hinshow & W. H. Feldman, Arch. Dermat. & Syph., February, 1947, 55: 222.*—(*J. S. Woolley*)

Chemotherapy of Iodonium and Sulfonium Compounds.—Only the iodonium compounds inhibited the growth of tubercle bacilli *in vivo* but they had no significant therapeutic action.—*Chemotherapy of Certain Iodonium and Sulfonium Compounds, B. L. Freedlander &*

F. French, Proc. Soc. Exper. Biol. & Med., November, 1946, 63: 319.—(F. B. Seibert)

Chemotherapy with Diphenylsulfone Derivatives.—A series of derivatives of diphenylsulfone, sulfoxide and sulfide were tested for *in vitro* tuberculostatic activity and for antituberculous therapeutic activity in guinea pigs. The following compounds in addition to the reference materials, 4,4′-diaminodiphenyl-sulfone and its derivative diasone, showed high *in vivo* activity: 4-benzylideneamino, 4′-aminodiphenylsulfone; 4-nitro, 4′acetyl-aminosulfoxide (hypo): 4,4′-diacetyl-aminodiphenylsulfoxide (oral). 4-Chloro, 4′aminodiphenylsulfide and the corresponding iodo derivative were highly tuberculostatic *in vitro* but were devoid of *in vivo* activity.—*Derivatives of Diphenylsulfone, Related Sulfoxides and Sulfides in Experimental Tuberculosis, B. L. Freedlander & F. French, Proc. Soc. Exper. Biol. & Med., November, 1946, 63: 361.—(F. B. Seibert)*

Complications with Diasone.—Severe toxic reactions were encountered in 2 patients during the use of usual therapeutic doses of diasone. In each case cyanosis was the first sign, followed rapidly by dyspnea, fever, exanthematous rash leading to bullae and exfoliation and marked reduction in red cells. One of the patients had a hemolytic reaction, with severe anemia and jaundice. Because of these serious, near fatal, reactions in 2 out of 14 patients treated with diasone for less than one month, the opinion is expressed that this drug should be discarded permanently and be replaced by a less toxic substance.—*Complications in Connection with the Use of Diasone in Tuberculosis, E. Hedvall, Acta tuberc. Scandinav., 1946, 20: 164.—(P. Q. Edwards)*

Pulmonary Changes after BCG Vaccination.—Pathological pulmonary shadows in BCG-vaccinated children are difficult to interpret, particularly when veil-like infiltrations and associated hilar indurations persist on the roentgenogram for only one to two months. A study of 9 such cases is reported, in which the diagnosis of primary tuberculosis was made in 2 cases in spite of failure to find bacilli. In each of these patients, there had been some question regarding the immunological response to BCG; one of these children may have been infected with tuberculosis before the vaccination. Two of the 9 cases were found to have atypical virus pneumonia by demonstration of cold autohemagglutinins in their sera. The 5 other cases had pulmonary changes of a much shorter duration than is characteristic of primary tuberculosis. Wallgren states that primary tuberculosis causes shadows to persist for six months before showing regression. These children had infiltrations lasting but one to two months, associated with increased sedimentation rates and brief periods of fever in several cases. The possibility of a more benign, shortened course for primary tuberculosis in BCG-vaccinated children should be considered, although the diagnosis of atypical virus pneumonia seems more likely in view of the absence of bacilli by gastric examinations in all cases, the brief or absent febrile period and the typically evanescent veil-like infiltrations in the parenchyma of the lungs. Unfortunately, cold autohemagglutinins were not tested for in 5 of these patients, which might have confirmed the diagnosis of virus pneumonia.—*Roentgenological Pulmonary Changes in BCG Vaccinated Children, G. Birke, Acta tuberc. Scandinav., 1946, 20: 107.—(P. Q. Edwards)*

Lupus following BCG.—Although BCG vaccination may occasionally give rise to abscess formation at the site of injection or a regional lymphadenitis, this is the first known case of post-vaccination lupus vulgaris developing over the area used for injection. The patient was a 16-year-old workman who was vaccinated with BCG in his left deltoid region. Ulceration appeared soon afterwards, followed by a slowly spreading lesion which became 7 x 6 cm. in size within six months. Local treatment with pyrogallic acid ointment seemed to produce temporary healing, soon to be followed by necrosis and

ulceration with typical nodules along the margins. Ten series of treatments with the Finsen light resulted in excellent improvement. Curiously, the patient still had a relatively weak reaction to 0.01 mg. of tuberculin, although his sedimentation rate was considerably increased.—*Lupus Vulgaris Developed in the Reaction to a Calmette Vaccination, S. Lumholt, Acta tuberc. Scandinav., 1946, 20: 136.*—(*P. Q. Edwards*)

Stain for Tubercle Bacilli.—Osol's method, in which acid-fast bacilli are stained with steaming carbol fuchsin and decolorized both with acid alcohol and sodium hyposulfite without counterstaining, was tried on 141 sputa and 100 gastric specimens. It was useful, especially with specimens containing rare bacilli, but has relatively numerous sources of error and cannot replace the usual Ziehl-Neelsen technique.—*La methode d'Osol dans la recherche des bacilles de Koch, B. Wissmer, Presse méd., March 15, 1947, 55: 181.*—(*E. Bogen*)

Carbol-Night-Blue Stain for Tubercle Bacilli.—Sputa and tissue sections stained with an alcoholic solution of night-blue in carbolic acid and counterstained with chrysoidin revealed more tubercle bacilli than Ziehl-Neelsen stains. Specimens negative by one method were also free of bacilli by the other.—*J. Quandt, Zentralbl. f. Bakt. u. Infektionskr., 1944, 151: 340.*—(*B. Gerstl*)

Respiration of Tubercle Bacillus.—Respiration of tubercle bacilli varies not only for a single species according to the particular strain, but also for a single strain according to the growth conditions which have been imposed upon it. Even when consumption of the medium is equally intense for two strains of the same species, their respirations can nevertheless be different, depending upon the use to which the bacilli put the consumed medium. Energy expenditures exacted by the culture being different for a single species according to the strain, bacilli of a certain strain may fix, at the time of multiplication, more carbon than the bacilli of another strain, and, consequently, form less carbon dioxide (consume less oxygen) at the expense of an equal quantity of carbonated compound. It is thus that, in certain cases, virulent variants, in order to form an equal weight of culture during a time, destroy more of the medium than attenuated variants. However, one may not conclude from these preliminary studies that a direct correlation exists between virulence and respiratory exchanges of tubercle bacilli.—*Les échanges respiratoires de bacilles tuberculeux de souches différentes, A. Andrejew, Ann. Inst. Posteur, March, 1947, 73: 235.*—(*P. Q. Edwards*)

Virulence of Tubercle Bacilli.—Since intravenous injections of very small numbers of tubercle bacilli into guinea pigs for virulence tests offer distinct advantages over subcutaneous injections, a method is described for locating suitable viens in the animals' legs. To obtain suspensions free of clumps of bacteria, filtering and centrifugation are employed for an optimal period of time. To determine the content of tubercle bacilli in such suspensions, a modification of Wright's method is described, wherein a suspension of ordinary baker's yeast is used in place of red cells, as the latter usually disintegrate during staining. This control suspension of yeast is mixed with the suspension of tubercle bacilli in suitable proportions, a smear is made from the mixture which is stained by the Ziehl-Neelsen technique. In a good preparation, bacilli and yeast cells lie singly and evenly distributed 2 to 4 per field. At least 200 cells or bacteria are counted. With such a technique, virulence tests have been carried out on various strains isolated from sputum in an effort to find a highly virulent human strain for experimental work.—*Virulence Tests on Tubercle Bacilli, G. Widström, Acta tuberc. Scandinav., 1946, 20: 171.*—(*P. Q. Edwards*)

Superinfection of Tuberculous Rabbits.—In genetically similar rabbits, there was no difference in the rate of progression of disease whether the contact remained in continuous

exposure to the contagion or whether it was removed therefrom immediately after the acquisition of a positive tuberculin reaction. The contagion to which the rabbits were exposed was very high so that the incidence of acquired disease was 73 per cent in the resistent (A) family and 85 per cent in the less resistant (C) family. The duration of the disease of the A rabbits, both those exposed and those not exposed to superinfection, was longer, an average of 4.6 and 5.4 months, as compared with 3.6 and 3.9 months, respectively, for the rabbits of low resistance. As in previous studies the A rabbits tended to acquire tuberculin sensitivity more rapidly than the C rabbits, their allergy was less developed during the course of their disease and the progression of the infection was slower and anatomically more chronic.—*Effect of Exogenous Superinfection on Naturally Acquired Bovine Tuberculosis in Inbred Rabbits, M. B. Lurie & Joyce Becker, Proc. Soc. Exper. Biol. & Med., November, 1946, 63: 465.—(F. B. Seibert)*

Pyogenic Infection in Tuberculosis.—Pyogenic infections, especially those occurring in the pharynx and mouth and spreading along the lymphatics toward the hilum, are of great importance in the pathogenesis of tuberculosis, according to Westergren. In trying to approach more closely the natural mode of infection by the upper respiratory tract, guinea pigs were inoculated intravenously with a measured amount of tubercle bacilli to which additional intranasal and submucous injections with *Streptococcus viridans* were given. Results showed that guinea pigs infected with tuberculosis, both those killed and those dying spontaneously, were all not only infected with tuberculosis but also with two, often three, different species of pyogenic bacteria. Although the *Streptococcus viridans* used proved to be nonpathogenic for the animals, the induced tuberculous infection gave rise to activation of latent organisms already present in the animal, as opposed to the control nontuberculous animals in which the same pyogens were found by culturing the respiratory passages. Intranasal instillation of broth also appeared to activate latent infections in nontuberculous animals, although spontaneous recovery usually took place. If, however, the installations were performed on tuberculous infected guinea pigs, the activated pyogenic infections took a malignant course which in turn accelerated the progress of the tuberculosis. Applicability of these finding to human tuberculosis seems possibly of importance.—*Multiple Infection in Experimental Tuberculosis in Animals, T. Packalén, Acta tuberc. Scandinav., 1946, 20: 199.—(P. Q. Edwards)*

Weltmann Reaction in Tuberculosis.—The Weltmann reaction, both in its original form and its nephelometric modification by Wuhrmann and Wunderly, together with sedimentation rate and Takata reaction were studied in 100 cases of exudative pulmonary tuberculosis. A low nephelometric curve (below 400 units) or a moderately high one combined with a shift of the Weltmann curve to the left indicates a poor prognosis. A high nephelometric curve (above 550 units) in the presence of left shift suggests improvement. The Takata reaction proved of no value.—*Zur Humoralpathologie der Lungentuberkulose, A. Pedrazzini, Schweiz. Ztschr. f. Tuberk., 1946, 3: 373.—(B. Gerstl)*

Diagnostic Bronchial Lavage.—In 10 apparently arrested patients, in all of whom the sputum had been negative for some time, bronchial washings proved positive in 6. While the method was apparently harmless in these cases, it seems inadvisable to try it in patients with bronchial asthma, low vital capacity or decompensated heart disease. Abreu's series at the Sao Sebastiao Hospital at Rio includes 313 cases. Positive results in Abreu's cases were 15.3 per cent.—*Diagnostic Bronchial Lavage, M. M. Bueno, Clín., tisiol., July-September, 1946, 1: 222.—(A. A. Moll)*

BCG Vaccination in Sarcoidosis.—Interest in a diagnostic test for Schaumann's disease

(*lymphogranulomatosis benigna*) has led to some experimental work with various types of techniques for BCG vaccination in an effort to determine the most efficacious method for production of a satisfactory and easily obtained biopsy specimen for pathological diagnosis. Rosenthal's percutaneous BCG vaccination method has been modified by Birkhaug by the use of a metal spring lancet which produces uniform punctures through a thin tissue paper soaked in vaccine. In a series of 92 people so vaccinated, 72 became positive to tuberculin; of these, only half became positive within three to four weeks following vaccination—a very small percentage when compared with results reported by Rosenthal and other investigators using the intracutaneous technique. In an effort to reproduce Lemming's attempts to obtain biopsy material for diagnosis of sarcoidosis, two series of patients were vaccinated by the above technique: several normal tuberculin-negative patients and 5 tuberculous (tuberculin-positive) patients. Excision of several of the small papules resulting from the vaccination was performed for pathological examination. No essential differences were found between the two groups of patients—both showed characteristic masses of polynuclear cells and histiocytes in the subcutaneous tissues. Patients with sarcoidosis are frequently tuberculin-negative, which suggests that the disease may be a type of tuberculosis with particular allergic conditions, a so-called positive anergy, including a high degree of immunity towards tuberculin. This condition further implies such a rapid destruction of tuberculin that the skin test invariably is negative. Lemming found that patients with sarcoidosis remained negative even when large doses of BCG were administered intracutaneously. Biopsy of a regional node after vaccination showed changes typical of sarcoidosis. In another case, cutaneous changes at the site of vaccination were both macro- and microscopically similar to skin manifestations of the disease. This type of evidence makes it seem theoretically possible that the Rosenthal-Birkhaug vaccination with subsequent excision of one or more papules after a suitable time interval might provide a relatively simple method for direct patho-anatomical diagnosis. Several patients with sarcoidosis have been vaccinated but in no case has the excised papule shown diagnostic changes. One case at another hospital has been reported, however, in which the diagnosis was made by examination of the post-vaccination nodule.—*On the Value of the Percutaneous BCG-Vaccination According to Rosenthal, O. Forssman, Acta tuberc. Scandinav., 1946, 20: 123.*—(*P. Q. Edwards*)

Sarcoidosis and Fungus Infection.—A general survey of the literature relating to the etiology of sarcoidosis is followed in this paper by detailed case histories of 8 patients in whom the clinical and roentgenological findings were indistinguishable from sarcoidosis; yet in each instance exposure to dust, moulds, or "burnt" grain in connection with threshing preceded development of symptoms. Monilia organisms were regularly demonstrated in the sputum of each patient. Many features of sarcoidosis point to a dust infection, with the upper respiratory passages, tonsils, lungs and conjunctivae as portals of entry. Subsequent spread by lymphatic channels ordinarily takes place, producing a disease closely resembling primary bronchomycoses with bilateral hilar adenopathy. Both in sarcoidosis and in similar syndromes arising in connection with the inhalation of fungi, there is often a prolonged tuberculin anergy or disappearance of a previously positive tuberculin skin reaction. Because of the history in each of these 8 cases of inhalation of dust while harvesting grain, feeding cattle or cleaning mouldy cellars and subsequent demonstration of monilia in the sputum, the original diagnosis of sarcoidosis was changed to bronchomycosis, in spite of the typical clinical, X-ray and patho-anatomical picture ordinarily designated as sarcoidosis. Localization and course of sarcoidosis agree more closely with a fungoid infection than with tuberculosis.—*Is Sarcoidosis a Fungoid Disease?, E. Törnell, Acta tuberc. Scandinav., 1946, 20: 212.*—(*P. Q. Edwards*)

Pulmonary Hydatid Cysts.—Conservative measures which have been used in the treatment of simple univesicular cysts are reviewed critically: (*1*) Expectant; with the hope that spontaneous expectoration will occur; there is great probability that the disease will progress. (*2*) Aspiration; while this has produced many cures there are also many dangers. (*3*) Artificial pneumothorax; this is very dangerous; it may cause rupture of the cyst with expectoration into a bronchus or expulsion into the pleural cavity. (*4*) Drugs and radiotherapy; these are of no value. (*5*) Bronchoscopy; this is of no value. In 133 reported cases in which hydatid cysts were coughed up, there were 31 deaths. In children, the greater frequency of spontaneous rupture, as well as the greater surgical risk, have been advanced as arguments for conservative therapy. The author disagrees with this reasoning. Upper lobe cysts are supposed to have a greater chance to be expectorated spontaneously. The dangers of operation upon cysts near the hilum are said to be greater. In both of these instances, the author disagrees with suggestions that conservative treatment is preferable. The only cases in which waiting is approved are those in which the cysts are very small. On the day prior to operation, a small pneumothorax is induced. If there are no adhesions, a thoracotomy is done. The cyst is located and packed off; it is then aspirated slowly but not tapped dry. Incision is made through the adventitia down to the laminated membrane. The cyst is removed easily. The incision in the adventitia is closed. The suture line is covered with visceral pleura. A catheter is left in the pleural space. Lobectomy is advised: (*1*) when the cyst is almost as large as the lobe, (*2*) when the cyst is old and has a tough adventitia and (*3*) for simple cysts which have caused bronchiectasis or pulmonary suppuration. In cases of simple bilateral hydatids, the treatment is the same. The treatment of complicated cysts is varied: (*1*) Daughter cysts; these result from *a*) previous spontaneous "cure" or *b*) hydatid fluid having been spilled at a previous operative site. The treatment is like that of a simple cyst. (*2*) Ruptured and infected cysts; lobectomy is indicated. (*3*) When a liver hydatid has ruptured into the thorax, *a*) the lesion is drained as widely as possible, *b*) all the hydatid elements are removed and *c*) later the degree of pulmonary damage is assessed and the diseased portion of lung is removed. (*4*) A persistent empty sac; this may be a source of hemorrhage or infection and lobectomy is indicated. Thoracoplasty and phrenic paralysis are of no value. (*5*) A dead cyst. This is dangerous and a lobectomy must be done.—*The Treatment of Pulmonary Hydatid Disease, N. R. Barrett, Thorax, March, 1947, 2: 21.*—(*A. G. Cohen*)

Syphilis of Lung.—Acquired chronic pulmonary syphilis is uncommon and often not recognized, though clinical recognition is becoming more frequent. It occurs five to ten years after infection, and more often in males than in females, but fatal progression is more common in females. A syphilitic pneumonitis may occur during early infection by an extension from syphilids in the upper respiratory tract, but the more common lung lesions are those in late syphilis, often in association with aortitis. The onset of the chronic form is insidious; symptoms are often lacking, and when present, are those of any chronic pulmonary lesion; physical signs depend upon the location, extent and character of the lesion. Frequent X-ray examinations are the great hope for a more frequent diagnosis. The usual chronic forms are gummata and interstitial sclerosis, with bronchiectasis being a possibility. The most notable histopathological difference from tuberculosis is the occurrence of necrosis *after* fibrosis in the syphilitic lesions. It is hardly possible to describe specific roentgen signs. The lesions may be discrete rounded densities, densities surrounded by exudate or linear fibrosis. They occur most often in the lower half of the lungs, and especially in the right lung. They often are in hilar and truncal locations, but may be subpleural. Clearance of the lesions during antisyphilitic therapy, using an X-ray method as a control, is the best presumptive proof of

the diagnosis. Resolution of the lesion, leaving fibrous scars, is the typical result. Four cases are reported; three were treated, one with penicillin, and clearing and residual fibrosis occurred.—*The Clinical, Radiologic, and Pathologic Aspects of Late Pulmonary Syphilis—Effects of Penicillin Therapy, G. V. Kulchar & F. Windholz, Am. J. Syph., Gonor. & Ven. Dis., March, 1947, 31: 166.—(W. H. Oatway, Jr.)*

Actinomycosis.—Among 240 patients with chronic bronchopulmonary infections, observed from May to November, 1945, *Actinomyces bovis* (Israeli) was isolated, by direct examination and culture from the sputum in 109 and from bronchoscopic specimens in 65. *Actinomyces bovis* may be an inhabitant of the normal mouth and the above observations indicate that it may also be frequently found in various types of bronchopulmonary infections. This occurs as a result of aspiration of oral and pharyngeal material in individuals whose defenses against aspiration have been weakened by infection. The presence of actinomyces in the lung is of no clinical significance in most instances until anaerobic conditions occur, such as blocking of a bronchus by a plug of exudate. Approximately 50 per cent of the patients with bronchiectasis had actinomyces in material obtained by bronchoscopy. There was nothing characteristic about this group except that the sputum appeared to be more copious, more foul and more frequently bloody than when the fungus was not present. Many of these patients were benefited by intratracheal penicillin and in several the fungus disappeared. Twenty patients from whom actinomyces was isolated by bronchoscopic aspiration are discussed in greater detail. These fell clinically into the following groups: chronic pneumonitis, lung abscess and pulmonary suppuration. Various other organisms were almost always present in the exudate. The onset of the pulmonary infection was usually insidious with low-grade symptoms. Sputum was foul and bloody in all patients. Oral hygiene was invariably poor and actinomyces was frequently isolated from tonsillar crypts, dirty gums and periapical abscesses. Bronchoscopic appearance was not specific. Penicillin or penicillin plus sulfadiazine, both in large doses, were the most effective medical treatment. *In vitro* experiments suggest the even greater efficacy of streptomycin in inhibiting the growth of actinomyces but further clinical experience is needed. Five patients without cavitation responded excellently to medical treatment which was continued for a period of eight to twelve weeks. An abscess healed on medical treatment in only one patient. Cavitary cases usually required surgery in the form of drainage or resection. The involved pulmonary tissue was markedly fibrotic. Actinomyces were readily isolated from abscesses in resected lungs. The presence of the fungus is less of a factor in influencing the clinical course than the mechanical factors of bronchial occlusion, tissue destruction and fibrosis. It is debatable whether these cases should be classified as pulmonary actinomycosis or rather as pulmonary suppurative disease in which the fungus is present. The clinical course did not appear significantly different from those cases in which the fungus was not present. All patients were treated similarly without reference to the fungus. Actinomyces was not responsible for any postoperative complications in this group. Three patients with abscesses were cured by external drainage; apparent cures have resulted following pneumonectomy in 2 and following lobectomy in 4.—*Bronchopulmonary Actinomycosis, E. B. Kay, Ann. Int. Med., April, 1947, 26: 581.—(H. R. Nayer)*

Histoplasmosis.—Histoplasmosis was demonstrated in a 7-months-old girl with anemia, leukopenia and hepatosplenomegaly, by bone marrow biopsy, histoplasmin skin test and positive cultures from blood, marrow, stool and duodenal contents. Necropsy showed wide-spread dissemination of intracellular yeast forms throughout the body. Culture on 7 per cent horse blood agar containing 20 units per cc. each of penicillin and

streptomycin at 32° and 38° C. yielded abundant filamentous forms in which characteristic tuberculate chlamydospores developed, from all tissues and fluids tested, except the bile and cerebrospinal fluid.—*Histoplasmosis in Infancy: The Pathologic Picture as Seen in One Case, L. A. Weed, A. M. Iams & H. M. Keith, Arch. Path., February, 1947, 43: 155.*—(*E. Bogen*)

Histoplasmin Sensitivity.—Charleston, South Carolina is in an area of known low histoplasmin sensitivity (about 2 per cent). A study was made of 494 school children by chest X-ray films and tuberculin tests. Seventy-two per cent (356 individuals) were nonreactors. Seven of these had calcifications in the lung by X-ray film. Four of the 7 reacted to histoplasmin. All of the 4 had previously lived in an area with a high incidence of sensitivity (Kentucky, Mississippi, Tennessee or Alabama).—*Pulmonary Calcifications and Sensitivity to Histoplasmin in Charleston, S. C., J. I. Waring & D. B. Gregg, Am. J. Dis. Child., February, 1947, 73: 139.*—(*W. H. Oatway, Jr.*)

Pulmonary Calcifications.—A series of 110,000 consecutive 35 mm. chest photofluorographic examinations performed at a naval training centre were reviewed and 102 cases, an incidence of less than 0.1 per cent, were rechecked by conventional 14″ x 17″ films. Of these, 21 were found to show uniformly distributed calcified lesions, usually all of the same size and called "disseminated miliary calcifications." The remainder, 81, demonstrated multiple calcified lesions irregularly scattered in the hila and lung parenchyma without symmetrical distribution and of varying size. All of these cases were of a disqualifying nature for entrance into the naval service. It is recommended that such cases be further investigated to determine the exact nature of the lesions.—*Multiple Pulmonary Calcifications, A. C. Wyman, U. S. Nav. M. Bull., March-April, 1947, 27: 244.*—(*E. A. Rouff*)

Rheumatic Pneumonia.—The term "rheumatic pneumonia" has been applied by some observers to characteristic pulmonary changes described in the course of active rheumatic fever. The precise relationship of these changes to rheumatic fever is not entirely clear. The possibility also exists that these pulmonary findings may be attributed, in part at least, to cardiac failure. Grossly, the lungs are rubbery and present a surface mottled with focal hemorrhages. Thickening of the alveolar walls, capillary engorgement and edema of the interstitial tissues are seen in the acute stages. In the chronic stage, there is considerable fibrosis of the alveolar walls with narrowing of the vascular bed. The alveolar exudate, hemorrhagic and fibrinous at the onset, gradually undergoes fibrous organization. Mononuclear cells are characteristically present in this exudate; large basophilic cells of the Aschoff type have also been observed. An hyaline pseudo-membrane is frequently present, covering the walls of the respiratory bronchioles. Fibrinous and destructive changes have been described in the walls of pulmonary and systemic arterioles. The presence of Aschoff bodies in the lungs has been noted but not confirmed. Clinical descriptions have differentiated a fleeting, clinically insignificant pneumonitis and a rapidly developing wide-spread and often fatal pneumonia. The authors have attempted to clarify the clinical and roentgen picture of this type of pneumonia by a survey of 6 autopsied cases of unequivocal rheumatic fever with carditis and characteristic anatomical pulmonary findings as described above. In all 6, there was an abrupt onset of acute respiratory distress. Dyspnea, cyanosis and orthopnea were constant features. Cough was dry and hacking, sputum scant and occasionally bloody, never rusty or purulent. Pathogenic organisms were usually absent from the sputum. Fever ranged from 100° to 105° F. Physical signs were scant. One patient developed a large bilateral effusion. The white count ranged from 14,000 to 26,000, with a polymorphonuclear leucocytosis. The roentgen appearance of the pneumonia was in

distinguishable from that usually associated with cardiac failure. The presence of usually multilobar and non-segmental infiltrations is of some value in ruling out bacterial and atypical pneumonia. Salicylates and penicillin did not alter the course of the disease. The carditis was in an active phase in all these patients; the diagnosis of rheumatic pneumonia should not be made in the absence of active carditis. Another significant differential consideration is the infrequency of bacterial pneumonia in active rheumatic fever; it occurred only twice in 100 attacks observed by the authors and both were pneumonitis on a bronchiectatic basis. No instances of lobar or atypical pneumonia were observed in this group. The presence of rheumatic pneumonia appears to carry grave prognostic significance.—*Rheumatic Pneumonia, D. W. Seldin, H. S. Kaplan & H. Bunting, Ann. Int. Med., April, 1947, 26: 496.*—(*H. R. Nayer*)

Rheumatic Pneumonia.—The lesions of rheumatic pneumonia may be specific, and allergic in their genesis and manifestations. A typical sequence of several phases has been described. Two new cases of rheumatic pneumonia are reported. Together they show most of the features of an exudative lesion resulting from injury to capillary endothelium, and parallel the findings in experimental anaphylactic pneumonitis. The histories also agree with the allergic concept, and stress a possible interval following subsidence of the symptoms of endocarditis.—*Rheumatic Pneumonia, J. I. Mossberger, J. Pediat., February, 1947, 30: 113.*—(*W. H. Oatway, Jr.*)

Congenital Bronchiectasis.—In a 13-year-old girl with a history of symptoms since the age of 4, the congenital nature of the bilateral bronchiectasis was evidenced by its association with situs transversus and nasal polyposis, the characteristic triad of Kartagener. In a 19-year-old man with bilateral bronchiectasis there were marked deformations of the thorax with anomalies of the ribs indicating a congenital origin. In both cases repeated unilateral pleural effusions were encountered. Such recurring unilateral pleural effusions in the course of bronchiectasis are asserted to be presumptive, if not pathognomonic of a congenital origin of the bronchiectasis.—*Les bronchiectasies congenitales, P. Lagesse & P. Buffard, Presse méd., March 19, 1947, 55: 197.*—(*E. Bogen*)

Segmental Bronchitis.—Bronchitis is not always, as commonly believed, a diffuse and generalized inflammation of the entire bronchial tree. Endoscopic examinations in both acute and chronic bronchitis have shown cases with localized edema, hyperemia, hypersecretion and hyperesthesia of a bronchial segment, limited both above and below by apparently normal mucosa. Such lesions may be associated clinically with a wide variety of symptoms. Sometimes they may be associated with a more or less homogeneous density in the midlung. Retention of secretions may result in local pulmonary disturbances.—*Bronchite segmentaire, E. Rist, P. Ameuille & J. M. Lemoine, Presse méd., March 15, 1947, 55: 173.*—(*E. Bogen*)

Bronchial Spasm.—Wheezing may occur in cardiac asthma without the presence of basal râles; from the standpoint of physical signs, this wheezing may be indistinguishable from the râles of bronchial asthma. In most cases, studies of the circulation velocity of the blood will differentiate cardiac from bronchial asthma. Contrary to previous opinion, adrenalin will produce relief of symptoms in most cases of cardiac asthma with wheezing respiration; 0.5 cc. of adrenalin was injected subcutaneously in 9 patients with heart failure with sibilant râles and markedly prolonged circulation time. In each case, there was a definite increase in vital capacity; this increase averaged 510 cc. Inhalation of vaponefrin in 5 cases produced comparable results. All the patients felt much improved and there were no untoward results. In 11 patients with cardiac failure and basal râles, but no wheezing, adrenalin and vaponefrin produced little or no increase in vital capacity. Four patients of the first group were followed

until frank cardiac failure with basal râles supervened; at this time, wheezing disappeared and no relief was obtained by the use of adrenalin. In 5 normals, used as controls, adrenalin produced no change in vital capacity. Vital capacity is increased by venesection in patients with cardiac failure and, similarly, in normal people. The exact mechanism of the action of adrenalin in increasing the vital capacity of patients with cardiac asthma is not clear. The speed of the action suggests that the change occurs as a result of relief of bronchiolar spasm.—*Bronchial Spasm in Cardiac Asthma, M. Plotz, Ann. Int. Med., April, 1947, 26: 521.—(H. R. Nayer)*

Lipid Pneumonia.—Changes in the lung produced by the introduction of oils have been a pitfall in diagnosis of chest diseases. A patient, 19, a member of the Women's Land Army, was admitted to the hospital on July 4, 1945, with an acute febrile illness resembling rheumatic fever with erythema nodosum. The chest was normal clinically; temeprature was 100.2°; pulse 120 and respirations 22. The fauces were injected. There were raised red patches on the legs. An X-ray film of the chest showed a collapsed right middle lobe and enlarged mediastinal lymph nodes. Blood picture was normal, sputum negative. By exclusion, a diagnosis of Hodgkin's disease was made. Two courses of X-ray therapy were given. No change was produced. On April 30, 1946, patient was readmitted. She was dyspneic and had enlarged neck veins and shallow respirations. Percussion was dull, and there was bronchial breathing in both lungs. X-ray films showed an increased mediastinal shadow near the lung roots. She died May 12th. Necropsy findings showed the air passages acutely inflamed. The mediastinal lymph nodes were enlarged. The lungs were firm and solid. On gross section the upper lobes were infiltrated by a firm, pinkish material. Histological appearance of the lungs showed intense histiocytic activity throughout the alveoli. On frozen section, the macrophages were seen to be distended with fat globules. On questioning her friends, no history of the use of an oil in nose drops or mouth spray could be ellicited. This condition may be more common than is often supposed and should be considered in the differential diagnosis of chronic inflammation of the lungs.—*Lipoid Pneumonia: A Pitfall in Diagnosis, R. E. Rewell, Brit. M. J., March 29, 1947, 4499: 409.—(R. W. Clarke)*

Industrial Lung Diseases.—Substances handled in industry may attack the respiratory tract and produce pneumonoconioses, inflammatory and allergic conditions and possibly carcinoma. Cadmium, vanadium and beryllium are important constituents of certain alloys. The first two metals, if inhaled in the form of oxides in dust or fumes produce inflammation of the upper and lower respiratory tract, which may be acute or chronic. Acute bronchopneumonia, at times fatal, may follow poisoning with cadmium oxide, and chronic bronchitis is more often seen in vanadium workers. Beryllium fumes are of statistically greater importance because of the use of this metal in the aircraft industry. The upper respiratory tract is profoundly irritated, and the inflammation may extend into the lung producing bronchiolitis and chemical pneumonia. Autopsy of some fatal cases showed a picture of atypical pneumonia with hemorrhage and edema. The predominating cell infiltration consisted of plasma cells. [Some beryllium cases have an X-ray appearance very much like disseminated nodular sarcoidosis, the nodules being rather small. There is also some histological similarity.] Bagassosis is characterized by acute febrile illnesses in which cough and dyspnea are outstanding. The X-ray film shows scattered miliary densities. The picture is one of acute diffuse bronchiolitis. The majority of cases clear within weeks or months, but some have resulted in chronic fibrosis, bronchiolitis and bronchiectasis. One such autopsy is on record. The etiological agent in this disease is not known. Bagasse contains 1 to 2 per cent of amorphous silica, and

0.1 per cent of quartz, but the majority of the quartz particles are larger than those considered necessary for production of silicosis. It is believed that fungi may play an important part in breaking down bagasse fiber into a fine vegetable dust, and may render this toxic. The disease resembles byssinosis. In the past it was felt that the high incidence of carcinoma in the Schneeberg miners was due to the radioactivity of the hard rock. Recently it has been questioned if the high arsenic content of the rock, 0.45 per cent, may not be the cause of development of cancer. Arsenic may also be the carcinogenic agent in the nickel and copper mines of Sudbury, Canada. In the field of pneumonoconiosis, silicosis is still the most important hazard. Recently there has been some tendency to ascribe a part in the pathogenesis of this disease to the accompanying anthracosis. Iron oxide, too, has been held to be rather harmless in the past and, while it is true that it does not produce fibrosis, it seems reasonable to assume that large accumulations of iron oxide in the lung would lead to some loss of elasticity and resulting functional impairment. These changes are observed in electric arc welders and to a lesser degree in oxacetylene welders. In boiler scalers, the pneumonoconiosis appears to be due to a combination of the effects of silica and iron oxide. Treatment of these diseases belongs properly in the field of industrial hygiene and preventive medicine. Much has been accomplished by attention to good ventilation, dust control measures and the wearing of protective clothing and respirators. Whenever possible, silica containing dusts used in industry were substituted by harmless dusts. It should be the rule that no person under 18 years be employed on or within 20 feet of blasting apparatus.—*Industrial Medicine, D. Hunter, Schweiz. med. Wchnschr., Sondernummer, September 16–21, 1946, 76: 917.*—(*H. Marcus*)

Phosgene Poisoning.—Six war-workers with acute exposure and 5 with chronic exposure to phosgene gas were studied for evidences of disturbance of pulmonary, circulatory and psychic functions. The acute exposure, after the initial pulmonary edema subsided, produced rather marked symptoms, but without a consistent pattern of disturbed pulmonary function. Such changes as were found indicated beginning pulmonary emphysema. There was marked effect at the psychic level, with suggestive correlation with the severity of symptoms. The patients chronically exposed to smaller amounts of the gas, but for periods of one and one-half to three and one-half years had less marked symptoms but more constant evidence of impaired pulmonary function due to emphysema. Psychic factors were not prominent in this group. A curious but striking symptom in both groups was rapid shallow respiration, which could be altered at will, but persisted in sleep and during oxygen administration; it was attributed to a disturbed Hering-Breuer reflex.—*Study of the Residual Effect of Phosgene Poisoning in Human Subjects: I. After Acute Exposure. II. After Chronic Exposure, M. Galdston, J. A. Luetscher, Jr., W. T. Longcope & N. Ballick, with assistance of Virginia L. Kremer, G. L. Filley & J. L. Hopson, J. Clin. Investigation, March, 1947, 46: 145, 169.*—(*A. A. Cohen*)

Postoperative Atelectasis.—In order to determine the time interval between operation and roentgenographic appearance of atelectasis, roentgenograms of the chest were taken immediately, four and twenty-four hours after gastrectomy. Of 55 cases, 26 developed abnormal signs, consisting of increased markings or various stages of atelectasis. These were not confined to any particular age group. There was no difference in incidence between those with antecedent chest disease and those without. The first signs of atalectasis were noted in the four-hour film in 5 cases. By twenty-four hours, there was involvement in 13 cases. The changes consisted of patchy or lobular atelectasis. In all these cases, there were abnormal physical signs such as râles, rhonchi or occasional bronchial breathing. There was no mediastinal shift. In 10 other cases, there was an increase in the vascular markings in either the lower lobes or the

hilar regions. In 7 the changes were first seen at four hours; in the others, they were not noted until twenty-four hours. Some of the changes noted at four hours cleared up by twenty-four hours. Where atelectasis was first noted at twenty-four hours, increased vascular markings in the affected areas had been noted at four hours. In 3 other cases, the changes were those of bronchopneumonia or of collapse with effusion. A review of the results from the standpoint of timing showed at four hours patchy atelectasis in 5 cases and increased vascular markings in 7 cases. Of the latter, by twenty-four hours the changes had either disappeared, remained the same or progressed to atelectasis. At twenty-four hours, there were 6 more cases of atelectasis. It is concluded that the twenty-four-hour film is the most valuable single examination.—*Atelectasis after Partial Gastrectomy, P. Springer, Lancet, March 8, 1947, 1: 289.*—*(A. G. Cohen)*

Cancer of Lung.—In two and one-half years, the authors have seen 107 patients with cancer of the lungs. Of these, only 21 (21.4 per cent) presented no contraindications for an exploratory thoracotomy. This low percentage is attributed to the delay in making the correct diagnosis. Cancer of the lung is asymptomatic in its early stages. Its principal symptoms, in order of their frequency encountered, are: cough, loss of weight, expectoration, hemoptysis, fever and anorexia. Two types can be distinguished: peripheral cancer or cancer of a large bronchus, central cancer. Whereas the latter type is diagnosed by bronchoscopic biopsy, the former necessitates an early exploratory thoracotomy. Of 21 patients operated upon, only 6 had positive bronchoscopic findings. For the other 15 patients, the diagnosis was made, on the basis of suspicious X-ray findings, during thoracotomy. The operation of choice is pneumonectomy. A lobectomy is insufficient as the hilar lymph nodes cannot be completely removed. Clinical contraindications are: metastases in other organs, especially in the axillary or cervical nodes; paralysis of a vocal cord; Horner's syndrome; paralysis of the diaphragm; hemothorax; cachexia. Bronchoscopic contraindications are: invasion of the trachea; widening of the angle of the bifurcation, which is a sign of invasion of the tracheobronchial nodes; general rigidity of the bifurcation and of the bronchial tree. Of the 21 thoracotomies, one case was lost during the operation from acute emphysema. Only 12 patients were benefited by a resection which reduces the operability in this series to 57.1 per cent (or 11.2 per cent of the entire series of 107). Eleven pneumonectomies and one left inferior lobectomy were done. Of those 12 patients, 3 died postoperatively. The lobectomy case showed brain metastases after one year and eight months. Nine patients are alive over a period of fifteen days to two years.—*Nuestra experiencia en el tratamiento quirurgico del cancer del pulmon, O. J. Cames, A. Cesanelli & F. E. Tricerri, An. de cir., September, 1946, 11: 103.*—*(W. Swienty)*

Carcinoma Emboli in Lung.—Definite thickening of the intima of smaller arteries and veins was often noticed during the histological examination of lungs of patients dying from carcinoma of various organs. This change was found in lungs disclosing no metastatic tumors as well as in those that did. These changes were more severe and much more frequent in carcinomatous patients than in patients of similar or older age groups without carcinoma. It has been known for many years that tumor emboli may occur in the lungs in the absence of metastasis; "tumor embolism is not metastasis." The present study is based on the histological examination of the lungs of 12 patients dying from carcinoma of various sources outside of the lungs. The ages of the patients varied from 36 to 60 years. Only those lungs were studied which histologically disclosed tumor emboli but no frank metastasis. These emboli were found in the smaller and smallest branches of the pulmonary artery, in capillaries, and in small pulmonary veins. A small sheath of fibrin and hyaline thrombi almost invariably were encountered adjacent to the tumor cells.

The thrombi seemingly caused atrophy of adjacent tumor cells which were gradually replaced by the growing thrombi. Eventually these thrombi became organized, but clumps of tumor cells were still recognizable either within the new channels or imbedded within the growing connective tissue. Thus, not the tumor emboli but the hyaline thrombus became organized and caused the disappearance of the tumor cells. When only mural thrombi were encountered, the eventual organization caused localized intimal thickening which very closely resembled pulmonary arteriosclerosis. (With 2 plates)—*The Fate of Carcinoma Emboli in the Lung, O. Saphir, Am. J. Path., March, 1947, 23: 245.*—(*J. S. Woolley*)

Bronchial Adenoma.—Five cases illustrate the histological structure and characteristics of bronchial adenoma. In different tumors, and frequently in different areas of the same tumor, clear tumor cells resembling secretory cells of the bronchial glands and deep-staining round cells similar to the basal cell layer may predominate. Since the tumors have invasive tendencies and are potentially malignant, radical surgical removal rather than local resection through a bronchoscope, is advised. —*Five Types of So-called Bronchial Adenoma, M. E. Sano & R. Meade, Arch. Path., March, 1947, 43: 235.*—(*E. Bogen*)

Hemangioma of Lung.—The condition is rare. Review of the French, American and English literature disclosed 5 cases. The author reports 2 cases in which the tumor was diagnosed clinically and removed surgically. The chief diagnostic features are: (*1*) nonspecific cardio-respiratory symptoms, (*2*) cyanosis, (*3*) polycythemia and clubbing of fingers, (*4*) exocardiac murmurs in the chest, (*5*) telangiectases on skin, mucous membranes and other viscera and (*6*) irregular circinate opacities in chest roentgenograms. The cyanosis is due to arterio-venous shunt. The telangiectases are most important in diagnosis; they are present chiefly on the face, lips and soft palate. The treatment is surgical resection; there is otherwise danger of severe hemorrhage.—*Cavernous Hemangioma of the Lung, W. Whitaker, Thorax, March, 1947, 2: 58.*—(*A. G. Cohen*)

Chorionepithelioma.—Although a chorionepithelioma is usually a highly malignant tumor, it at times may digress from the usual clinical course. Pulmonary metastases occur frequently, grow rapidly, and are an important factor in mortality. Regression and even disappearance of pulmonary metastases may follow removal of the primary tumor by surgery or radiation. The case of a 32-year-old woman with an isolated metastasis of such a tumor in the lung, for which a lobectomy was done, is reported. The patient after three years was in excellent health. The Ascheim-Zondek was positive the day before operation and negative the day following. A pan-hysterectomy performed a month after lobectomy failed to reveal any evidence of disease of the pelvis.—*Metastatic Chorionepithelioma of the Lung Treated by Lobectomy, H. C. Maier & H. C. Taylor, Jr., Am. J. Obst. & Gynec., April, 1947, 53: 674.*—(*R. W. Clarke*)

Thoracoscopy in Chest Wounds.—In all penetrating wounds in the chest when pneumothorax or hemopneumothorax develops, thoracoscopy will furnish valuable information on the extent of the injury, intrapleural hemorrhage, the involvement of the lung, etc. It will also permit the removal of blood and often obviate the need of an exploratory thoracotomy. Five cases are described to illustrate the value of the method.—*A toracoscopia como método de exploração nas feridas penetrantes do tórax, J. M. Castello Branco, Clín. tisiol., July-September, 1946, 1: 229.*—(*A. A. Moll*)